DOCUMENT RESUME

ED 076 712 TM 002 722

AUTHOR Sutherland, J. E. N., Comp.
TITLE Tertiary Education Entrance Project: Interim Report on the Evaluation of the T.E.E.P. Series A Test Battery.
INSTITUTION Australian Ministry of Science and Education, Canberra.
PUB DATE 71
NOTE 70p.

EDRS PRICE MF-$0.65 HC-$3.29
DESCRIPTORS *Academic Performance; Achievement Tests; *Admission (School); Admission Criteria; *College Admission; Comparative Analysis; Sex Differences; *Statistical Data; Tables (Data); *Test Results
IDENTIFIERS *Australia

ABSTRACT

This interim report summarizes ongoing research reported from the Australian Capital Territory, Queensland, Tasmania and Western Australia on the relationship between matriculation through the Tertiary Education Entrance Project Series A Test Battery and university performance. In view of the preliminary nature of the findings, the tables are presented with a minimum of comment. The correlations reported are generally low, but it is considered too early to consider the project a failure. Data tabulated concern: (1) summary statistics and frequency distributions for T.E.E.P. Papers; (2) sex differences; (3) comparison of university entrants; (4) comparison of school leavers throughout Australia; (5) relationship between T.E.E.P. matriculation performance and teachers' estimates; and (6) prediction of university performance. (KM)

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TERTIARY EDUCATION ENTRANCE PROJECT :

INTERIM REPORT ON THE EVALUATION OF THE T.E.E.P.

SERIES A TEST BATTERY

A summary of the main research reported from the Australian Capital Territory, Queensland, Tasmania and Western Australia on the relationship between T.E.E.P. Series A, matriculation and university performance

Compiled and written by J.E.N. Sutherland of the Department of Education and Science, with the assistance of the programming and research staff of the Department.

DEPARTMENT OF EDUCATION AND SCIENCE

CANBERRA

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INTRODUCTION

This report is a summary of research reported from the Australian Capital Territory, Queensland, Tasmania and Western Australia on the relationship between T.E.E.P. Series A, matriculation and university performance. It has been compiled from research in progress in the Department of Education and Science and from reports issued by the various institutions and individuals conducting their own studies on the project.

In a report of this nature it is sometimes difficult to maintain the appearance of a cohesive and unified approach. This is inevitable in attempting to draw a common thread through isolated studies undertaken on different bases, especially when these studies are still in progress but at different stages of development, and only preliminary findings have been reported. For example some reports have focussed on T.E.E.P. in relation to total matriculation or university performance, others on its relation to performance in individual subjects only. Again some studies have reported correlations based on the performance of all students, others only on the performance of those who succeeded. Also reports of means and correlations have not always been accompanied by sample sizes and other essential qualifying information, thus making it difficult at times to evaluate results and draw meaningful conclusions from the data.

In view of the preliminary and somewhat tentative nature of the findings, and the limitations normally expected of any interim report, the tables are presented with a minimum of essential comment, beyond which the reader is invited to make his own interpretations. A comprehensive analysis of T.E.E.P. and the subsequent performance at tertiary level of those students tested in the project is steadily proceeding within the various institutions associated with the project. This will take some time to complete, but it should then be possible to present an account which is more balanced and cohesive than the general review attempted here.

Although it could appear from the evidence presented that T.E.E.P. Series A was somewhat less successful than conventional matriculation in predicting university success, to conclude on this basis that T.E.E.P. is a failure would be both hasty and premature. Before making any such judgment with confidence one would need to consider several factors in addition to the low (even disappointing) correlations reported. These include issues of motivation, the novel style of the T.E.E.P. tests when first used in 1968, and the emphasis placed by teachers in the past on conventional examination techniques and syllabus-based skills. There is also the vital question of whether the correlational model is really the most

appropriate one for this discussion.

Until all research has been completed, and the various institutions have had the opportunity to consider T.E.E.P. in proper perspective and publish their final reports, one must exercise caution in making judgments. Most of the findings to date have been reported from the Australian Capital Territory, where the population might be regarded as atypical and there are fewer university faculties. One must also remember that, although this is a TERTIARY Education Entrance Project, the emphasis so far has been almost entirely on university selection; research in the colleges of advanced education may well alter the picture. Again only T.E.E.P. Series A has been considered here since detailed analysis is not yet available for all students who sat for T.E.E.P. Series B in 1969 and entered tertiary institutions in 1970, while those tested with T.E.E.P. Series C and the Australian Scholastic Aptitude Test in 1970 have just completed their first year of tertiary education. Nevertheless a brief report on T.E.E.P. Series B from the University of Western Australia has been included as an Appendix for the sake of interest.

ACKNOWLEDGEMENTS

Acknowledgements are due to the following institutions and persons for assisting with the administration of the project and making available the results of subsequent research :

The Australian Council for Educational Research, in particular Mr. B. Rechter.

The Australian National University, in particular Professor C.A. Gibb of the Psychology Department.

The Education Department of Tasmania, in particular Mr. L.D. Blazely of the Research Branch.

The University of Western Australia, in particular Mr. A.W. Anderson of the Research Unit in University Education.

Thanks must also go to the Departments of Education in New South Wales and Western Australia for permission to test high school students in their respective systems, and to the University of Queensland Faculty of Education for making available the results of their experiment.

EXPLANATORY AND STATISTICAL NOTES

1. The term "School Leavers" is used to describe students in the final (matriculation) year of secondary school.

2. For ease of reference the sources of data used in the compilation of each table are acknowledged in the Index to Tables.

3. For the sake of convenience the Australian Capital Territory is included in the meaning of the word State.

4. Raw scores and standard scores.

The data processing for the Australian Capital Territory, Tasmania and Western Australia included conversion to standard scores, and these, in the main, have been used in all subsequent research. The Queensland experiment in 1969, however, was conducted in isolation from the main project and the papers were marked separately by the University of Queensland. From reports received of research on T.E.E.P. Series A conducted in Queensland it appears that only raw scores have been used there. Standardisation was performed by converting raw scores for all school leavers within each State, but not across States, to scores with a mean of 50 and a standard deviation of 12. Thus for purposes of interstate comparisons standard scores would be useless since each school leaving population would show the same mean and standard deviation, but this inconvenience does not exist for comparisons within a single State.

5. All correlations are Pearson's product-moment correlations.

6. Tests of significance of the difference between two means are 2-tail, the null hypothesis being that there is no difference between the means. The reader who feels that a 1-tail test is justified in some situations will find that sufficient information has been given to enable him to make such a test for himself.

7. Only univariate methods have been used in the statistical analysis, although it is recognised that much of the data is better suited to analysis by multivariate methods. It is essential to keep this point clearly in mind when considering the nature of the hypothesis being tested in each case, and the reader will find occasional reference to this in the text just to emphasise the point. (See, for example, page 22.) A number of multivariate studies is now in progress.

BACKGROUND TO THE TERTIARY EDUCATION ENTRANCE PROJECT

Series A Test Battery

Towards the end of 1967 the Department of Education and Science received approaches from the Minister for Education in Tasmania, the Australian National University and the University of Western Australia for Commonwealth support for an investigation into selection methods for tertiary education. This investigation, which was to become known as the Tertiary Education Entrance Project (T.E.E.P.), was supported with an initial allocation from the Commonwealth of $ 80,000 to cover the costs of test development and data processing. The costs of administration and follow-up studies were borne by the other participants.

The first stage of the project involved the development of a battery of objective tests, together with an essay paper, by the Australian Council for Educational Research. The objective tests were considered to be "content-free" in the sense that they required the candidate to comprehend and deal with new material that did not form part of any school syllabus. Nevertheless they did in fact fall within the scope of certain broadly defined ability areas. The first test battery, known as T.E.E.P. Series A, consisted of five papers spread over a total testing time of eight hours as follows :

Paper 1	(1¼ hours)	Quantitative reasoning.
Paper 2	(2 hours)	Comprehension and reasoning in the physical and biological sciences.
Paper 3	(2¼ hours)	Written expression - essays.
Paper 4	(1¼ hours)	Comprehension and reasoning in the social sciences.
Paper 5	(1¼ hours)	An experimental style of paper, testing interpretation and appreciation of material chosen from art, literature, history and humanities generally.

T.E.E.P. Series A was administered to all final year secondary students in the Australian Capital Territory, Tasmania and Western Australia in 1968, and to small university and college samples in Queensland, South Australia and Victoria.

Series B Test Battery

In 1969 a modified form of the test battery known as T.E.E.P. Series B was developed and again administered extensively in secondary schools in the Australian Capital Territory, Tasmania and Western Australia, and to several small samples in other States. T.E.E.P. Series B consisted of three papers, involving $5\frac{1}{4}$ hours testing, as follows :

Paper 1	(2 hours)	Quantitative reasoning.
Paper 4	($1\frac{1}{4}$ hours)	Comprehension and reasoning in the social sciences.
Paper 5	(2 hours)	Art, literature and humanities.

(The numbers for each paper refer to corresponding papers in Series A.)

Series C Test Battery

In 1970 a further revision known as T.E.E.P. Series C was produced and was administered to all final year secondary students in Queensland. The Series C battery consists of six papers spread over a total testing time of $9\frac{1}{4}$ hours as follows :

Paper 1	($1\frac{1}{2}$ hours)	Quantitative reasoning.
Paper 2	($1\frac{1}{2}$ hours)	Comprehension and reasoning in the physical and biological sciences.
Paper 3	($2\frac{1}{4}$ hours)	Written expression - essays.
Paper 4	($1\frac{1}{4}$ hours)	Comprehension and reasoning in the social sciences.
Paper 5	($1\frac{1}{2}$ hours)	Interpretation and appreciation of selected passages from literature, history and humanities generally.
Paper 6	($1\frac{1}{4}$ hours)	A test involving pattern, style and structure with visual material.

The Australian Scholastic Aptitude Test

An innovation to the project in 1970 was the development by the Australian Council for Educational Research of a single test, known as the Australian Scholastic Aptitude Test (A.S.A.T.), for which the Commonwealth

allocated $ 45,000. (This was in addition to the $ 80,000 allocated in 1968, thus bringing the total Commonwealth contribution to $ 125,000.) The A.S.A.T. was administered in all States except Victoria. It differs from the Series A, B and C batteries in being an omnibus test of general scholastic ability and is less obviously structured within definite ability areas. Nevertheless it has three sub-scales in its 110 questions as follows :

Part A (42 questions) tests deductive thinking in mathematics, science and social science; it is characterised by convergent thinking to a logically deducible answer.

Part B (39 questions) tests the ability to comprehend written material in the humanities, to make inferences from and be sensitive to the implications of the material presented, and to compare and contrast ideas.

Part C (29 questions) tests sensitivity to pattern, form, style and structure in visual and verbal material.

The A.S.A.T. has certain advantages in brevity and ease of administration as it requires only three hours compared with two days for a full T.E.E.P. battery.

1970 Testing Program

The complete testing program for each of the States in 1970 was as follows :

Queensland	-	Series C battery and A.S.A.T. on the final year school population.
Western Australia	-	Series B battery and A.S.A.T. on the final year school population.
South Australia	-	A.S.A.T. on the final year school population.
Tasmania	-	A.S.A.T. on a final year school sample.
New South Wales	-	A.S.A.T. on a sample of 5th form school pupils.

In addition, high schools in Darwin and Alice Springs were included in the South Australian program, and some Canberra 5th form pupils were in the New South Wales sample.

SUMMARY STATISTICS AND FREQUENCY DISTRIBUTIONS FOR T.E.E.P. PAPERS

Australian Capital Territory

Table 1 provides a convenient quick reference to the main summary statistics of the 1968 T.E.E.P. Series A testing program in the Australian Capital Territory. Means and standard deviations on T.E.E.P. papers are given for the sixth form secondary school population ("school leavers"), both male and female, and for those members of this population who entered the Australian National University in 1969. The data for the university entrant group is further classified by students who passed and failed in their first year at university. (The statistics in Table 1 have been calculated accurately from the test results, and are not approximations from the grouped data in the frequency distributions described below.)

Frequency distributions on all T.E.E.P. Series A papers are given in Table 2 for all school leavers in 1968, both male and female, in the Australian Capital Territory. Table 2A gives frequency distributions for the 1969 entrants to the Australian National University, both pass and fail, who sat for T.E.E.P. tests in 1968 as school leavers in the Australian Capital Territory.

The data presented in the distributions of Tables 2 and 2A are represented graphically by frequency polygons in Figures 1 to 10.

(For the purposes of this and all subsequent analyses on data from the Australian National University in this report, a faculty pass for full-time students was defined as passing more than half the subjects attempted; for part-time students it was passing at least half the subjects. Thus a full-time student attempting four subjects would be credited with a pass if he succeeded in three or four subjects. A part-time student attempting two subjects would be credited with a pass if he succeeded in one or two subjects.)

TABLE 1.

SUMMARY OF MEANS AND STANDARD DEVIATIONS (STANDARD SCORES)
FOR T.E.E.P. PAPERS IN THE AUSTRALIAN CAPITAL TERRITORY
1968 SCHOOL LEAVERS AND 1969 UNIVERSITY ENTRANTS

		UNIVERSITY ENTRANTS					SCHOOL LEAVERS		
		All	Full-time	Part-time	Pass	Fail	All	Male	Female
T.E.E.P. Paper 1 (Quantitative)	Mean	54.71	55.15	51.84	54.56	55.10	49.85	52.11	46.02
	Std.dvn.		11.27	10.13	11.34	10.75	11.65	11.69	10.52
	Number	233	202	31	170	63	800	503	297
T.E.E.P. Paper 2 (Phys. & biol.) sciences	Mean	55.11	55.78	50.65	54.92	55.61	49.37	51.23	46.19
	Std.dvn.		11.56	11.20	12.32	9.73	11.95	12.41	10.36
	Number	235	204	31	171	64	814	514	300
T.E.E.P. Paper 3 (Essays)	Mean	54.16	54.50	51.97	55.56	50.43	48.40	46.20	51.98
	Std.dvn.		11.16	10.33	11.02	10.41	12.96	12.83	12.35
	Number	231	200	31	168	63	782	485	297
T.E.E.P. Paper 4 (Social sciences)	Mean	54.85	55.70	49.13	55.48	53.23	49.62	49.55	49.74
	Std.dvn.		9.64	11.78	10.81	8.22	12.15	12.41	11.64
	Number	232	202	30	167	65	782	500	282
T.E.E.P. Paper 5 (Art, literature, humanities)	Mean	54.63	55.12	51.37	55.95	51.20	49.39	47.85	52.13
	Std.dvn.		11.43	11.36	11.33	11.22	12.04	12.53	10.55
	Number	229	199	30	165	64	778	498	280
T.E.E.P. Total (All five papers)	Mean	273.71	276.85	254.03	277.34	263.93	247.76	248.16	246.93
	Std.dvn.		39.11	39.00	40.85	34.35	47.44	50.30	42.06
	Number	218	188	30	159	59	722	456	266

Note : The university entrants were those students who sat for T.E.E.P. tests in the Australian Capital Territory in 1968 as school leavers, and entered the Australian National University in 1969.

TABLE 2.

FREQUENCY DISTRIBUTIONS FOR T.E.E.P. PAPERS (STANDARD SCORES)

1968 SCHOOL LEAVERS AUSTRALIAN CAPITAL TERRITORY

Class Intervals	Frequencies														
	T.E.E.P. Paper 1			T.E.E.P. Paper 2			T.E.E.P. Paper 3			T.E.E.P. Paper 4			T.E.E.P. Paper 5		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
0 - 9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10 - 19	2	2	4	2	1	3	10	6	16	2	1	3	6	0	6
20 - 29	9	14	23	23	17	40	31	8	39	24	15	39	23	5	28
30 - 39	59	72	131	68	67	135	98	25	123	78	36	114	107	26	133
40 - 49	133	87	220	143	105	248	154	77	231	146	84	230	146	72	218
50 - 59	174	102	276	143	80	223	134	105	239	145	86	231	126	113	239
60 - 69	90	15	105	102	29	131	35	60	95	76	47	123	65	48	113
70 - 79	32	5	37	29	1	30	20	14	34	26	13	39	20	15	35
80 - 89	4	0	4	4	0	4	3	2	5	3	0	3	5	1	6
90 - 99	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS	503	297	800	514	300	814	485	297	782	500	282	782	498	280	778

Note : Description of T.E.E.P. tests

Paper 1 - Quantitative Paper 2 - Physical & biological sciences Paper 3 - Essays

Paper 4 - Social sciences Paper 5 - Art, literature, humanities

TABLE 2A. FREQUENCY DISTRIBUTIONS FOR T.E.E.P. PAPERS (STANDARD SCORES)

1969 UNIVERSITY ENTRANTS AUSTRALIAN NATIONAL UNIVERSITY

(Students who sat for T.E.E.P. tests in the Australian Capital Territory in 1968 as school leavers)

Class Intervals	Frequencies														
	T.E.E.P. Paper 1			T.E.E.P. Paper 2			T.E.E.P. Paper 3			T.E.E.P. Paper 4			T.E.E.P. Paper 5		
	Pass	Fail	Total	Pass	Fail	Total	Pass	Fail	Total	Pass	Fail	Total	Pass	Fail	Total
0 - 9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10 - 19	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0
20 - 29	3	1	4	4	0	4	1	2	3	4	0	4	1	1	2
30 - 39	15	6	21	16	4	20	11	5	16	9	1	10	7	7	14
40 - 49	34	11	45	35	15	50	29	23	52	28	21	49	33	22	55
50 - 59	67	22	89	53	24	77	69	21	90	60	28	88	67	19	86
60 - 69	33	20	53	44	17	61	40	10	50	51	13	64	45	13	58
70 - 79	17	2	19	17	3	20	15	2	17	15	2	17	10	2	12
80 - 89	1	1	2	2	1	3	1	0	1	0	0	0	2	0	2
90 - 99	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS	170	63	233	171	64	235	168	63	231	167	65	232	165	64	229

Note : Description of T.E.E.P. tests

Paper 1 - Quantitative Paper 2 - Physical & biological sciences Paper 3 - Essays

Paper 4 - Social sciences Paper 5 - Art, literature, humanities

FIGURE 1. FREQUENCY POLYGON FOR DISTRIBUTION OF SCORES ON T.E.E.P. PAPER 1

1968 SCHOOL LEAVERS -- AUSTRALIAN CAPITAL TERRITORY

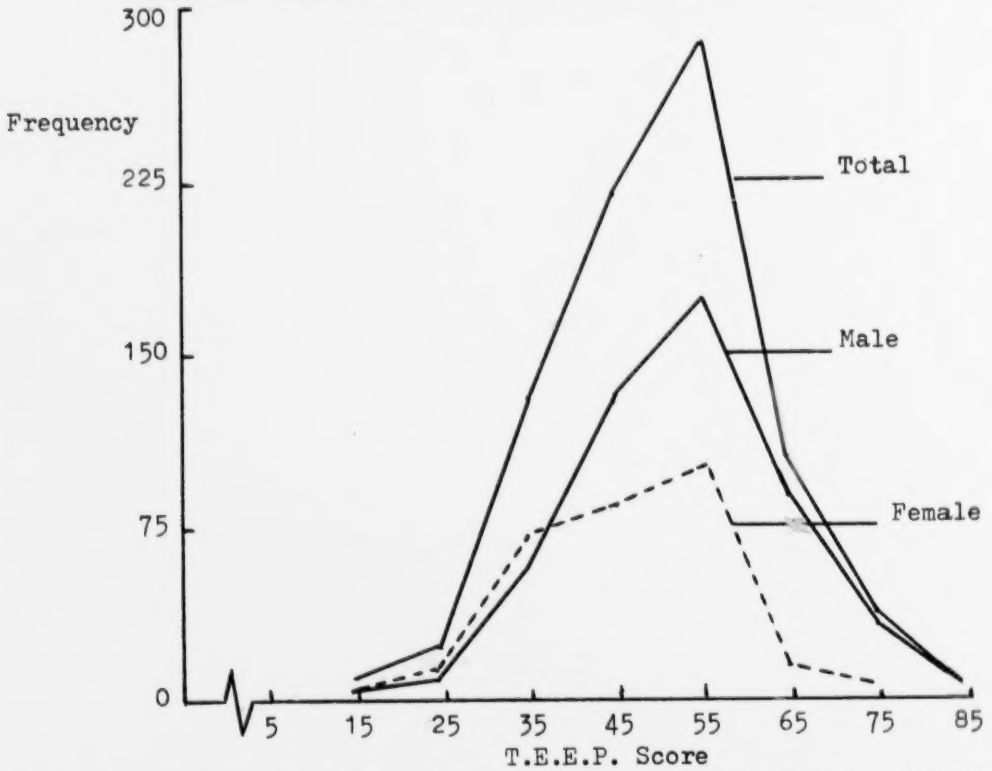


FIGURE 2. FREQUENCY POLYGON FOR DISTRIBUTION OF SCORES ON T.E.E.P. PAPER 2

1968 SCHOOL LEAVERS -- AUSTRALIAN CAPITAL TERRITORY

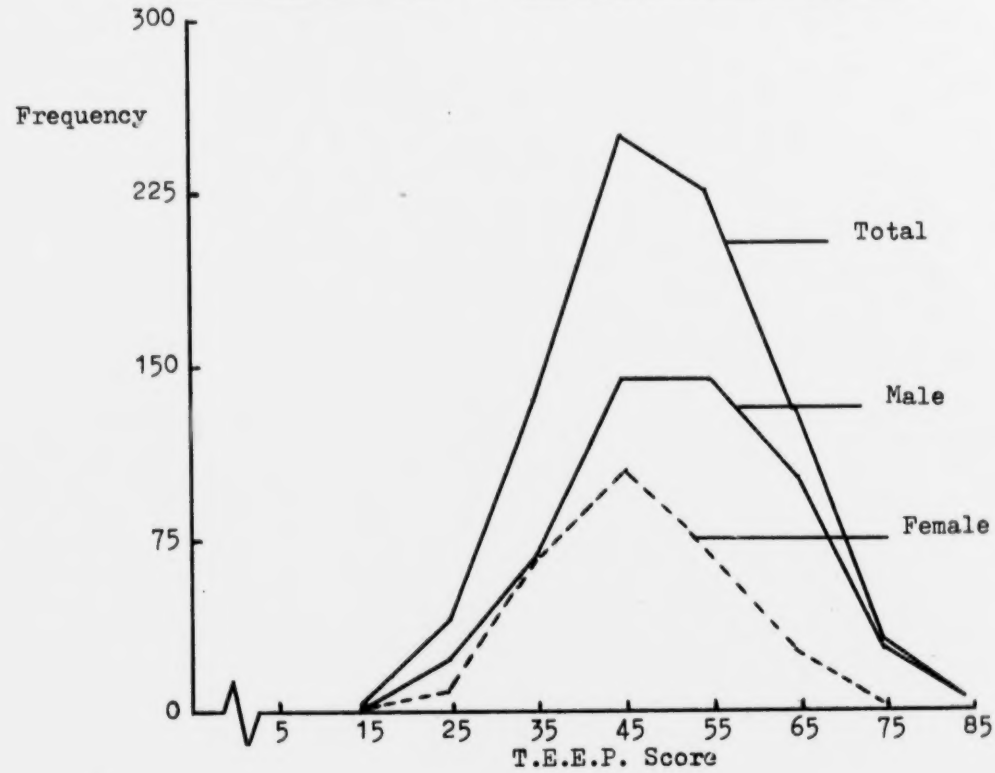


FIGURE 3. FREQUENCY POLYGON FOR DISTRIBUTION OF SCORES ON T.E.E.P. PAPER 3
1968 SCHOOL LEAVERS -- AUSTRALIAN CAPITAL TERRITORY

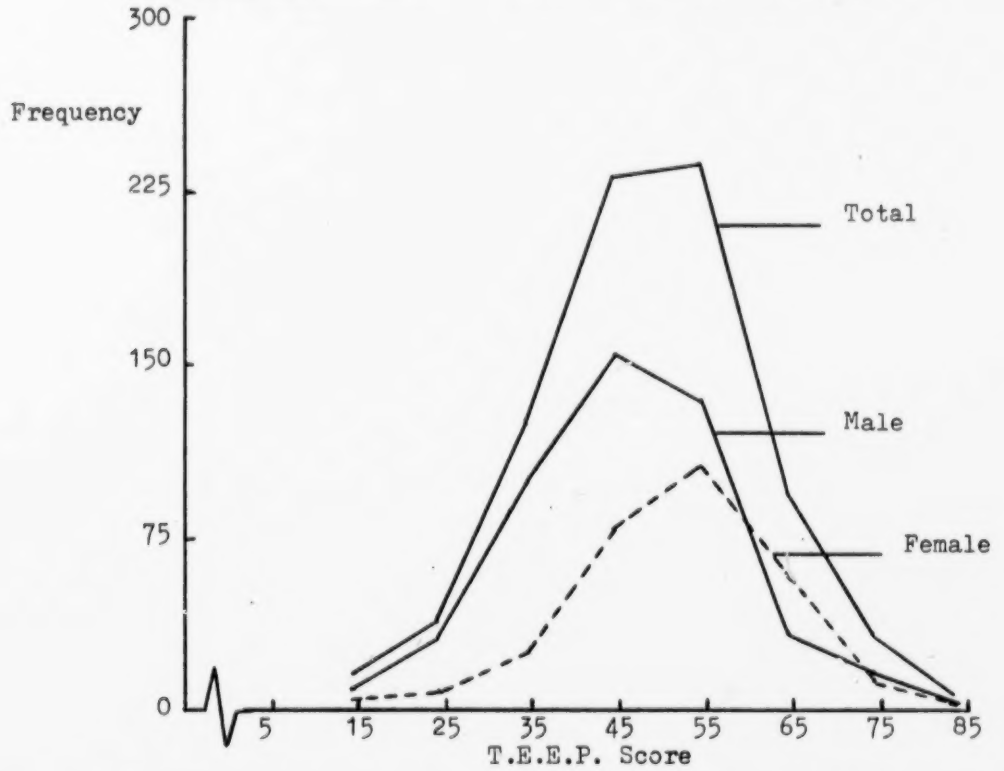


FIGURE 4. FREQUENCY POLYGON FOR DISTRIBUTION OF SCORES ON T.E.E.P. PAPER 4
1968 SCHOOL LEAVERS -- AUSTRALIAN CAPITAL TERRITORY

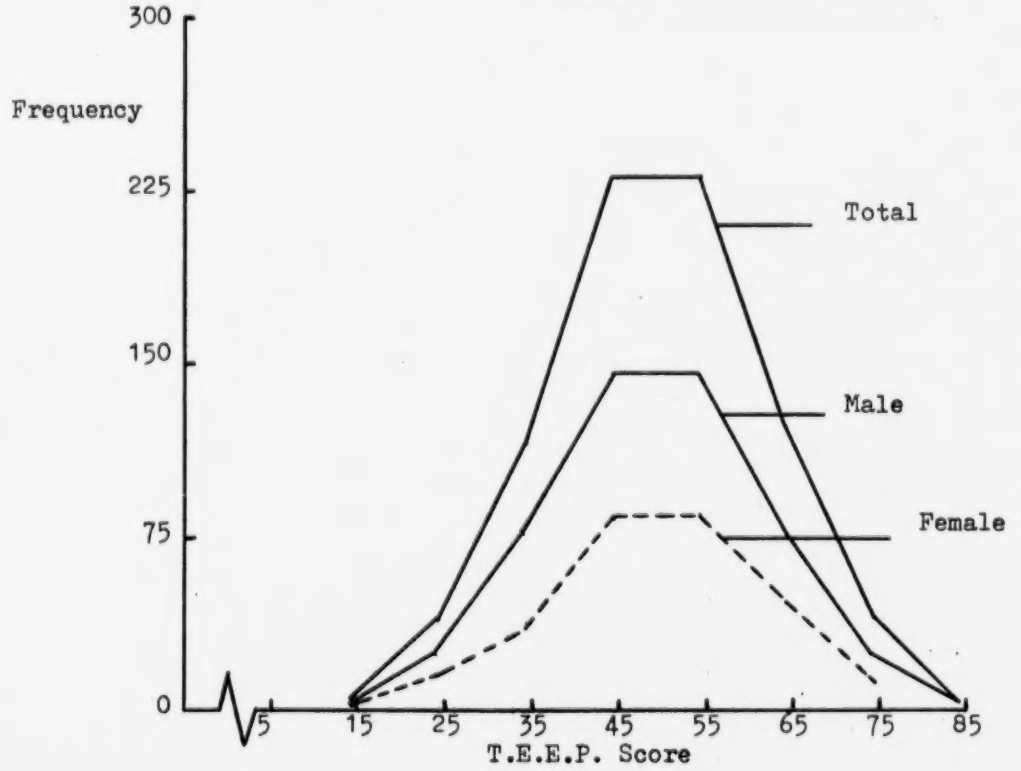


FIGURE 5. FREQUENCY POLYGON FOR DISTRIBUTION OF SCORES ON T.E.E.P. PAPER 5

1968 SCHOOL LEAVERS -- AUSTRALIAN CAPITAL TERRITORY

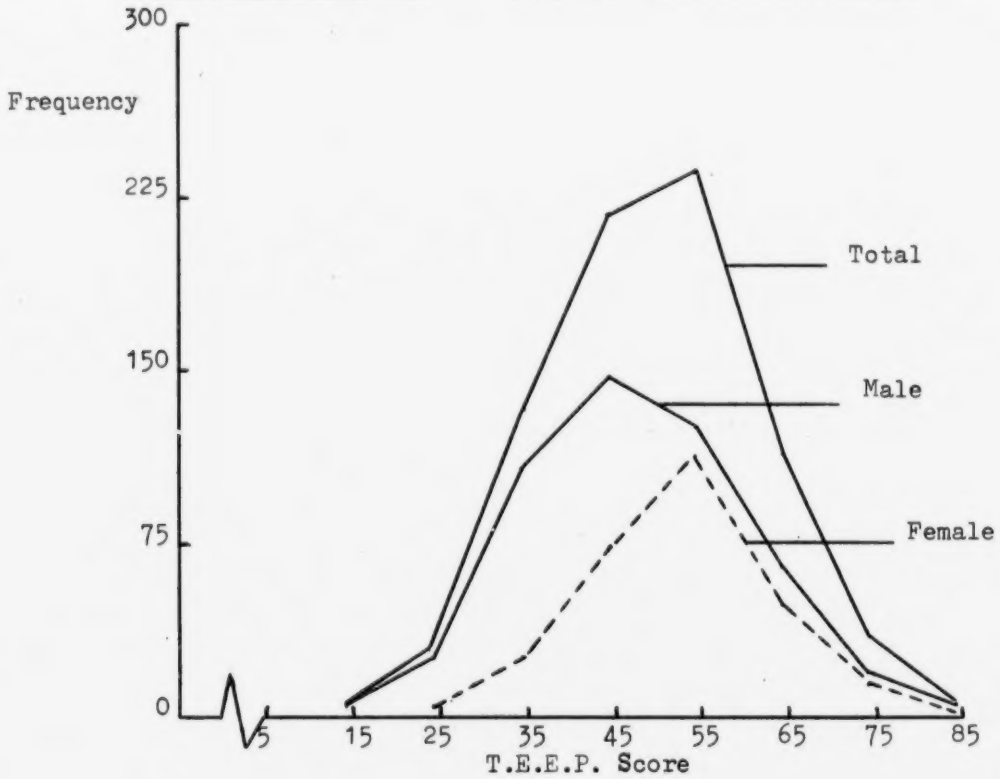


FIGURE 6. FREQUENCY POLYGON FOR DISTRIBUTION OF SCORES ON T.E.E.P. PAPER 1

1969 UNIVERSITY ENTRANTS -- AUSTRALIAN NATIONAL UNIVERSITY
(Students who sat for T.E.E.P. tests in 1968 as school leavers)

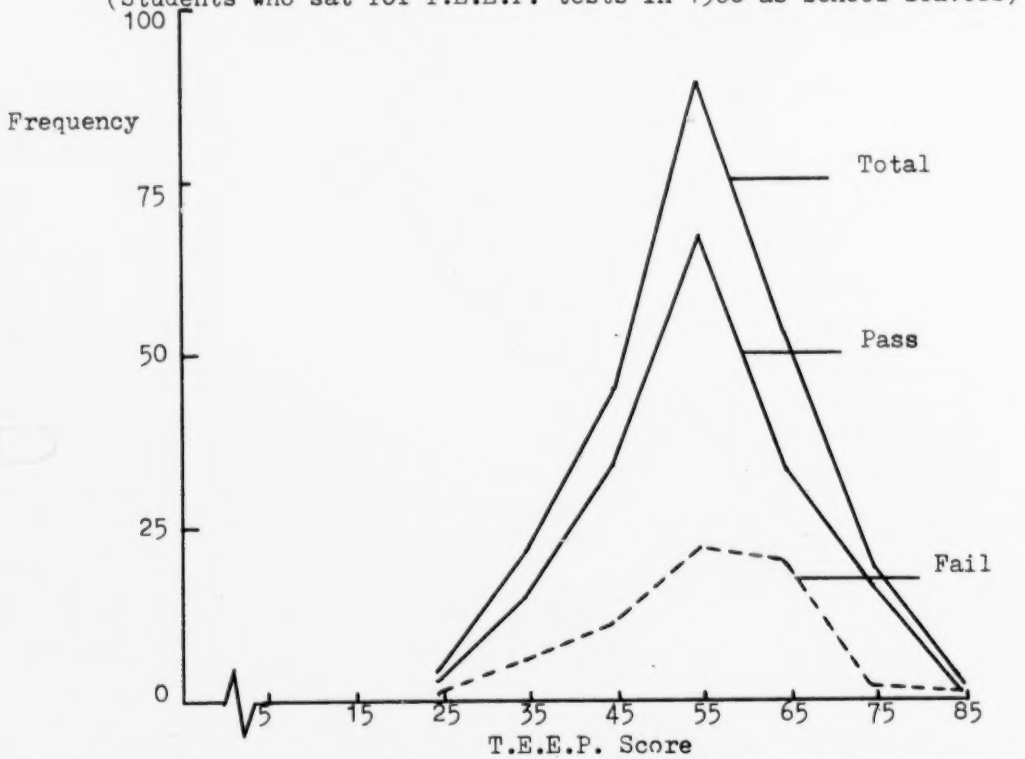


FIGURE 7. FREQUENCY POLYGON FOR DISTRIBUTION OF SCORES ON T.E.E.P. PAPER 2

1969 UNIVERSITY ENTRANTS -- AUSTRALIAN NATIONAL UNIVERSITY
(Students who sat for T.E.E.P. tests in 1968 as school leavers)

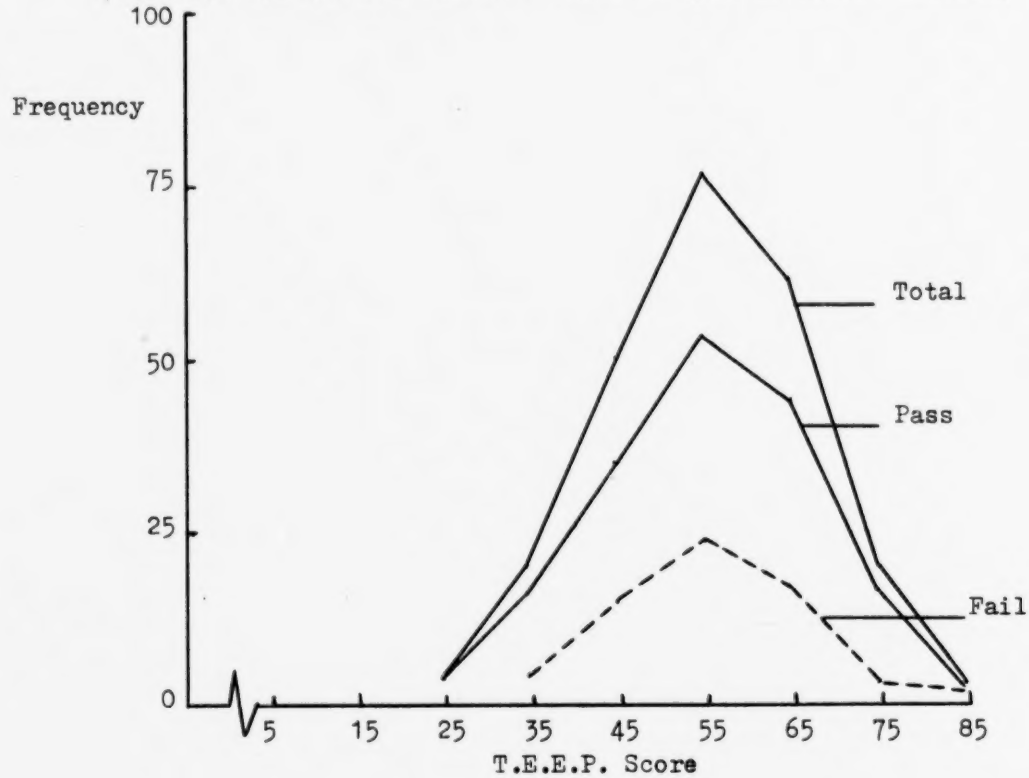


FIGURE 8. FREQUENCY POLYGON FOR DISTRIBUTION OF SCORES ON T.E.E.P. PAPER 3

1969 UNIVERSITY ENTRANTS -- AUSTRALIAN NATIONAL UNIVERSITY

(Students who sat for T.E.E.P. tests in 1968 as school leavers)

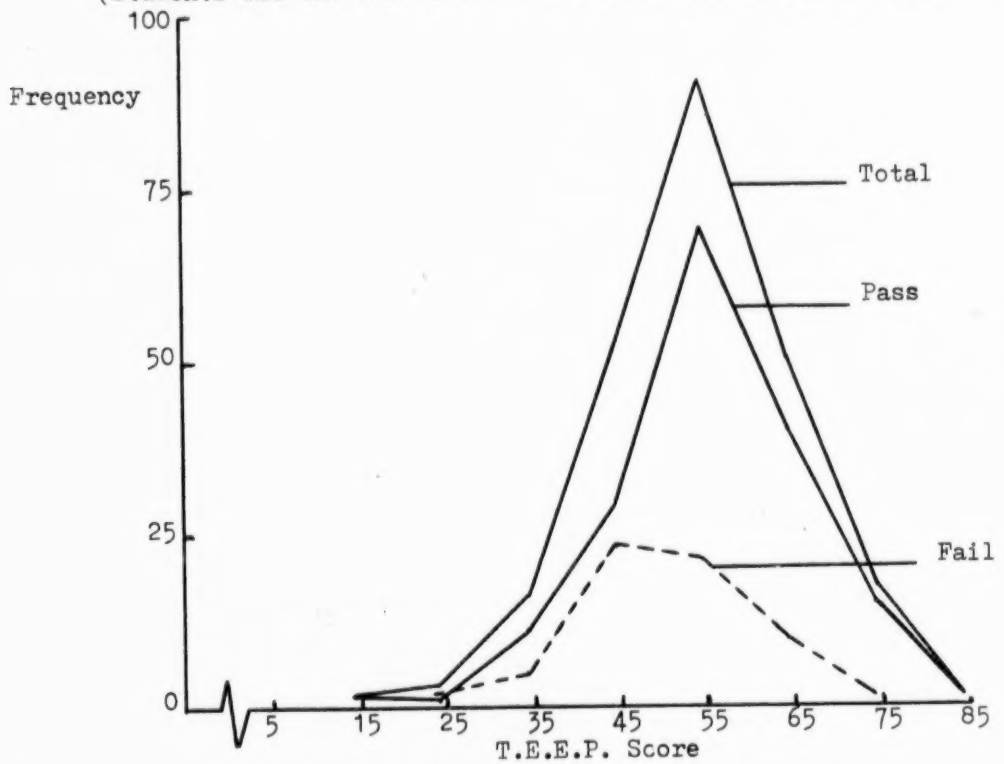


FIGURE 9. FREQUENCY POLYGON FOR DISTRIBUTION OF SCORES ON T.E.E.P. PAPER 4

1969 UNIVERSITY ENTRANTS -- AUSTRALIAN NATIONAL UNIVERSITY

(Students who sat for T.E.E.P. tests in 1968 as school leavers)

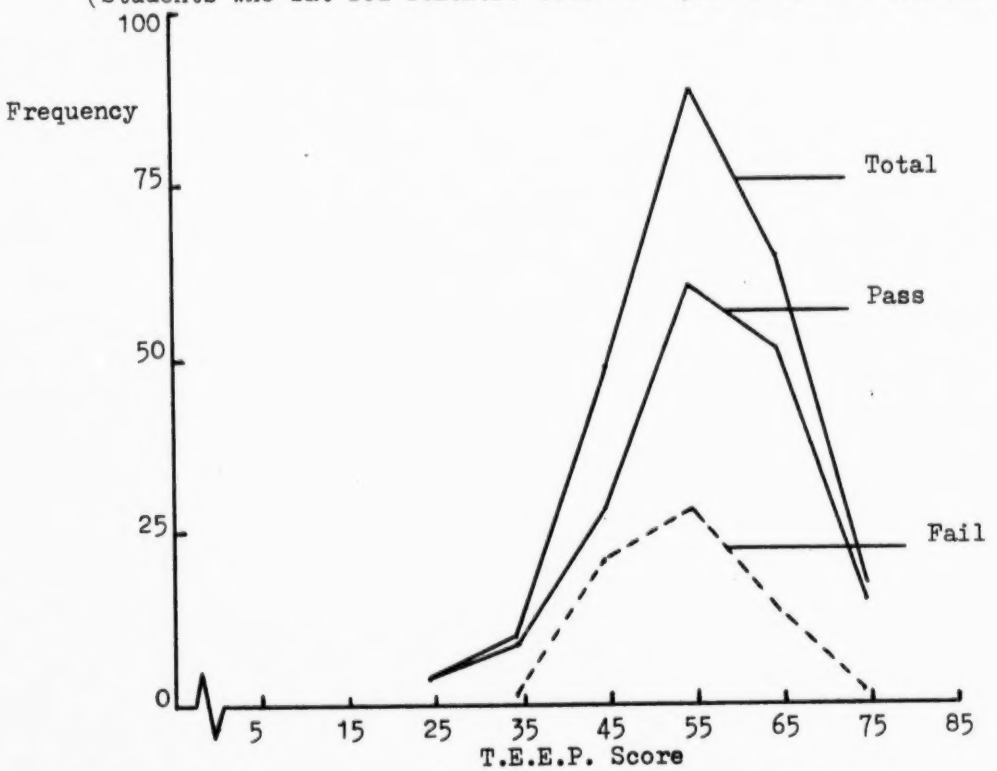
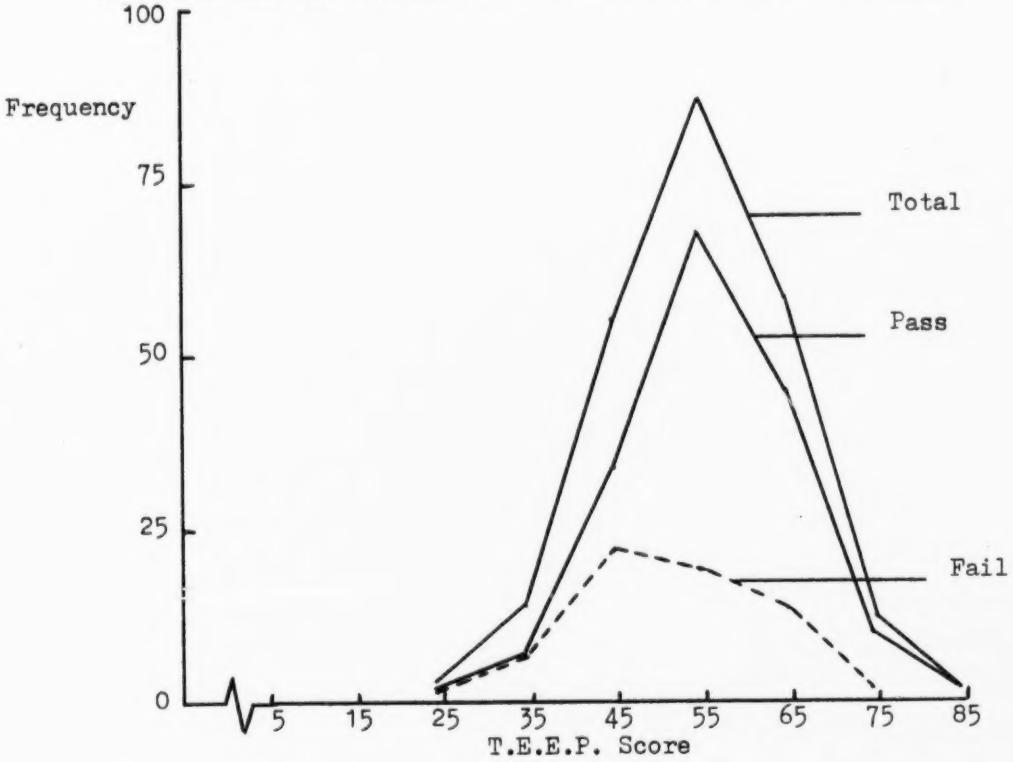


FIGURE 10. FREQUENCY POLYGON FOR DISTRIBUTION OF SCORES ON T.E.E.P. PAPER 5

1969 UNIVERSITY ENTRANTS -- AUSTRALIAN NATIONAL UNIVERSITY

(Students who sat for T.E.E.P. tests in 1968 as school leavers)



SEX DIFFERENCES

Table 3 gives means and standard deviations on each T.E.E.P. paper for all male and female school leavers in the Australian Capital Territory. (Frequency distributions of T.E.E.P. scores for males and females were presented in Figures 1 to 5 and Table 2 of the preceding section.)

The difference between means for males and females on each paper separately has been tested for significance by the normal distribution. (See Appendix 4.) Considered in isolation, the differences are highly significant (at the 0.1% level) for T.E.E.P. papers 1, 2, 3 and 5, and only on paper 4 (social sciences) do both sexes appear to demonstrate the same ability. The direction of the differences is also quite interesting, males being clearly superior on papers 1 and 2 (quantitative and scientific), females on papers 3 and 5 (essays; art, literature and humanities). It has since become apparent that paper 5 was measuring different abilities, and it has been replaced by two papers (5 and 6) in the Series C battery. Whether both of the new papers will again discriminate between the sexes to the same extent as the old paper 5 remains to be seen.

(The statistically inclined reader will appreciate that considering differences in isolation is not the same thing as considering them simultaneously. More sophisticated methods of multivariate analysis should be used when testing an hypothesis about simultaneous group differences on several criterion measures. This is being done and will be more fully discussed in a later report.)

Strictly speaking, the means and standard deviations for both sexes combined in the column headed "All" should have been standardised at 50 and 12 respectively on each paper. The slight discrepancies are probably due to the fact that standardisation was performed on fewer cases (678) than the number of school leavers who actually sat for all five papers in the Australian Capital Territory (722). The reason for this is not clear, but investigations have failed to reveal that the omission of cases was other than random.

TABLE 3. MEANS AND STANDARD DEVIATIONS (STANDARD SCORES) FOR T.E.E.P. PAPERS

1968 SCHOOL LEAVERS AUSTRALIAN CAPITAL TERRITORY

		SEX		All	z	Significance of difference between sexes
		Male	Female			
T.E.E.P. Paper 1 (Quantitative)	Mean	52.11	46.02	49.85		
	Std.dvn.	11.69	10.52	11.65	7.59	0.1% level
	Number	503	297	800		
T.E.E.P. Paper 2 (Phys. & biol. sciences)	Mean	51.23	46.19	49.37		
	Std.dvn.	12.41	10.36	11.95	6.22	0.1% level
	Number	514	300	814		
T.E.E.P. Paper 3 (Essays)	Mean	46.20	51.98	48.40		
	Std.dvn.	12.83	12.35	12.96	6.26	0.1% level
	Number	485	297	782		
T.E.E.P. Paper 4 (Social sciences)	Mean	49.55	49.74	49.62		
	Std.dvn.	12.41	11.64	12.15	0.21	N.S.
	Number	500	282	782		
T.E.E.P. Paper 5 (Art, literature, humanities)	Mean	47.85	52.13	49.39		
	Std.dvn.	12.53	10.55	12.04	5.07	0.1% level
	Number	498	280	778		
T.E.E.P. Total (All five papers)	Mean	248.16	246.93	247.76		
	Std.dvn.	50.30	42.06	47.44		
	Number	456	266	722		

COMPARISON OF UNIVERSITY ENTRANTS

Differences between faculties

Quite a few interesting comparisons based on T.E.E.P. tests can be made of the abilities of university entrants. In this regard it might be of special interest to compare faculty or subject intakes at a particular university on selected T.E.E.P. papers or combinations of papers; for example, Science students with Engineering students on papers 1 and 2, Arts with Economics on papers 4 and 5, or all faculties on all papers, singly and in combination, to mention just a few possibilities. The reader intending to make special faculty comparisons on selected combinations of T.E.E.P. papers would need to formulate and test his own hypotheses by appropriate multivariate methods. Only simple analysis of variance (see Appendices 1 and 2) has been used here to test the null hypothesis of no overall variation between faculties on each paper separately, and no attempt has been made to compare selected faculties on special combinations of T.E.E.P. papers.

The faculty comparisons on T.E.E.P. papers reported here are for all faculties at the Australian National University and for three faculties at the University of Queensland; these are given in Tables 4 and 5. In Queensland the variation between the three faculties chosen for the experiment was found to be highly significant (at the 1% level at least) on every T.E.E.P. paper. At the Australian National University variation between faculties was significant on all but paper 5 (art, literature and humanities), although on paper 4 (social sciences) the level of significance was only 5%. Another interesting feature of the Australian National University results is the clear superiority of Science students overall, and the comparatively mediocre performance of Arts and Economics students. Science students top scored on papers 1 and 2 (quantitative; physical and biological sciences), and had a higher T.E.E.P. total than other students. Only on paper 3 (essays) did Arts students show to advantage over all other faculties. On papers 4 and 5, in which they might have been expected to excel, Arts students took third place behind Science, the variation on each of these papers not being highly significant.

From the University of Western Australia comparisons on T.E.E.P. papers and other ability tests, including reading, for first year subject intakes have been reported in considerable detail by Anderson, although they have not been included here. Anderson has noted that, in general, Science students obtain high scores on T.E.E.P. papers 1 and 2 (quantitative; physical and biological sciences) and low scores on T.E.E.P. paper 3 (essays) and reading tests, while Humanities

and Social Science students do well on T.E.E.P. paper 3 and reading. [1]

The Australian National University and the Western Australian data are based on students who sat for T.E.E.P. tests as school leavers in 1968 and who entered university in 1969. The Queensland figures are based on first year students who were given T.E.E.P. tests at the commencement of their university course in 1969. Nothing further is known about the composition of the Queensland groups; the presence of mature age students, repeat students or transferees from other faculties could have affected the results.

Differences between full-time and part-time students

The only information available for part-time students is from the Australian National University and is based on the limited number of such students (thirty one) who sat for T.E.E.P. tests in 1968 as school leavers in the Australian Capital Territory. Comparisons between full-time and part-time students on each T.E.E.P. paper separately are presented in Table 6 and show that full-time students obtained higher scores on every paper. Considered in isolation, the differences are significant at the 1% level on paper 4 (social sciences) and at the 5% level on paper 2 (physical and biological sciences).

TABLE 4. MEANS AND STANDARD DEVIATIONS (STANDARD SCORES) FOR T.E.E.P. PAPERS

1969 UNIVERSITY ENTRANTS AUSTRALIAN NATIONAL UNIVERSITY

(Full-time students who sat for T.E.E.P. tests in the Australian Capital Territory in 1968 as school leavers)

		FACULTY						
		Arts	Economics	Law	Oriental Studies	Science	All full-time students	Significance of variation between faculties
T.E.E.P. Paper 1 (Quantitative)	Mean	49.37	57.59	55.46	47.36	62.66	55.15	0.1% level
	Std.dvn.	10.68	9.78	8.65	9.98	8.46	11.27	
	Number	79	22	26	11	64	202	
T.E.E.P. Paper 2 (Phys. & biol. sciences)	Mean	51.16	57.74	54.77	47.55	62.51	55.78	0.1% level
	Std.dvn.	10.24	7.76	10.28	13.10	10.69	11.56	
	Number	79	23	26	11	65	204	
T.E.E.P. Paper 3 (Essays)	Mean	57.99	48.91	54.96	55.82	51.86	54.50	1% level
	Std.dvn.	10.18	11.92	13.10	11.68	9.66	11.16	
	Number	78	23	24	11	64	200	
T.E.E.P. Paper 4 (Social sciences)	Mean	54.53	52.29	58.38	52.09	57.86	55.70	5% level
	Std.dvn.	8.96	10.67	9.05	8.10	9.81	9.64	
	Number	76	24	26	11	65	202	
T.E.E.P. Paper 5 (Art, literature, humanities)	Mean	55.88	49.30	55.19	57.27	56.02	55.12	N.S.
	Std.dvn.	10.22	9.25	13.29	12.33	11.90	11.43	
	Number	73	24	27	11	64	199	
T.E.E.P. Total (All five papers)	Mean	269.86	266.14	280.50	260.20	290.13	276.85	
	Std.dvn.	37.22	38.52	38.15	45.67	35.72	39.11	
	Number	71	22	24	10	61	188	

TABLE 5. MEANS AND STANDARD DEVIATIONS (RAW SCORES) FOR T.E.E.P. PAPERS

1969 1ST YEAR STUDENTS UNIVERSITY OF QUEENSLAND

(Full-time students who sat for T.E.E.P. tests at commencement of 1st year in 1969)

		FACULTY			
		Dentistry	Medicine	Social Work	Significance of variation
T.E.E.P. Paper 1 (Quantitative) Maximum score possible = 40	Mean	22.5	24.0	13.9	0.1% level
	Std.dvn.	5.6	5.8	5.2	
	Number	28	192	62	
T.E.E.P. Paper 2 (Phys. & biol. sciences) Maximum score possible = 63	Mean	40.6	39.8	28.6	0.1% level
	Std.dvn.	5.8	7.8	8.5	
	Number	28	192	62	
T.E.E.P. Paper 3 (Essays) Maximum score possible - not known	Mean	13.5	13.6	13.5	Not available
	Std.dvn.	Not available			
	Number	28	192	62	
T.E.E.P. Paper 4 (Social sciences) Maximum score possible = 50	Mean	26.4	30.1	28.2	1% level
	Std.dvn.	7.0	6.2	7.5	
	Number	28	192	62	
T.E.E.P. Paper 5 (Art, literature, humanities) Maximum score possible = 55	Mean	26.1	30.5	26.7	0.1% level
	Std.dvn.	6.0	6.0	7.5	
	Number	28	192	62	
T.E.E.P. Total (All five papers)	Mean	123.5	137.5	111.4	
	Std.dvn.	Not available			
	Number	28	192	62	

TABLE 6. COMPARISON BETWEEN FULL-TIME AND PART-TIME STUDENTS

MEANS AND STANDARD DEVIATIONS (STANDARD SCORES) FOR T.E.E.P. PAPERS

1969 UNIVERSITY ENTRANTS AUSTRALIAN NATIONAL UNIVERSITY

(Students who sat for T.E.E.P. tests in the Australian Capital Territory in 1968 as school leavers)

		Full-time	Part-time	z	Significance of difference between full- and part-time
T.E.E.P. Paper 1 (Quantitative)	Mean	55.15	51.84	1.67	N.S.
	Std.dvn.	11.27	10.13		
	Number	202	31		
T.E.E.P. Paper 2 (Phys. & biol. sciences)	Mean	55.78	50.65	2.37	5% level
	Std.dvn.	11.56	11.20		
	Number	204	31		
T.E.E.P. Paper 3 (Essays)	Mean	54.50	51.97	1.26	N.S.
	Std.dvn.	11.16	10.33		
	Number	200	31		
T.E.E.P. Paper 4 (Social sciences)	Mean	55.70	49.13	2.91	1% level
	Std.dvn.	9.64	11.78		
	Number	202	30		
T.E.E.P. Paper 5 (Art, literature, humanities)	Mean	55.12	51.37	1.68	N.S.
	Std.dvn.	11.43	11.36		
	Number	199	30		
T.E.E.P. Total (All five papers)	Mean	276.85	254.03		
	Std.dvn.	39.11	39.00		
	Number	188	30		

Note : Significance tests in the Table above are 2-tail, the null hypothesis being simply that there is no difference between full-time and part-time students. However, the discerning reader will notice that the z values are significant at the 5% level for a 1-tail test on papers 1 and 5, should he wish to speculate on a directional hypothesis, namely that full-time students are better than part-time students. Whether such an hypothesis can be justified on a priori grounds is debatable.

COMPARISON OF SCHOOL LEAVERS THROUGHOUT AUSTRALIA

One of the interests of T.E.E.P. is in the comparison which it affords of the abilities of school leavers throughout Australia. Comparisons, in terms of raw scores, between the Australian Capital Territory, Tasmania and Western Australia are presented in Table 7.

Opinions may differ as to the statistical interpretation one should place on this type of data. One view is that since it was obtained in State wide testing programs, the means and standard deviations may be regarded as State population parameters for the year 1968. Another view prefers to treat them as sample statistics and estimate the probability that they belong to a single homogeneous population of abilities throughout Australia. For the convenience of those holding the latter view, the overall variation between States on each paper separately has been tested by simple analysis of variance and found to be significant at the 0.1% level in every case. (See Appendix 3.) With such large numbers, however, even small variations are apt to be statistically significant, although they need not necessarily be of any practical importance. (Actually the differences, which appear rather small in terms of raw scores, would have been several points greater had it been possible to express them in standard scores - see Explanatory and Statistical Notes, page 8.) The variations are in fact quite interesting, but whether or not they can be regarded as important is open to debate.

TABLE 7. MEANS AND STANDARD DEVIATIONS (RAW SCORES) FOR T.E.E.P. PAPERS

1968 SCHOOL LEAVERS

		Australian Capital Territory	Tasmania	Western Australia	Significance of variation
T.E.E.P. Paper 1 (Quantitative) Maximum score possible = 40	Mean	16.9	15.9	17.1	0.1% level
	Std.dvn.	6.2	5.7	6.1	
	Number	678	1569	2378	
T.E.E.P. Paper 2 (Phys. & biol. sciences) Maximum score possible = 63	Mean	35.3	33.4	33.3	0.1% level
	Std.dvn.	8.7	7.9	8.5	
	Number	676	1567	2378	
T.E.E.P. Paper 4 (Social sciences) Maximum score possible = 50	Mean	27.8	24.3	25.1	0.1% level
	Std.dvn.	7.2	6.8	7.1	
	Number	653	1558	2390	
T.E.E.P. Paper 5 (Art, literature, humanities) Maximum score possible = 55	Mean	27.9	25.5	25.9	0.1% level
	Std.dvn.	6.6	6.1	6.0	
	Number	644	1561	2381	

Note : T.E.E.P. Paper 3 (Essays) has not been included as different marking methods were used in different States.

RELATIONSHIP BETWEEN T.E.E.P., MATRICULATION PERFORMANCE AND TEACHERS' ESTIMATES

Correlations between T.E.E.P. papers and matriculation subjects are shown in Tables 8, 9, 9A and 10 for the 1968 school leavers in the Australian Capital Territory and Tasmania, and for the 1969 university entrants in Western Australia. Results for the Australian Capital Territory (Table 8) are in the form of intercorrelations between T.E.E.P. scores, Higher School Certificate scores and teachers' estimates of Higher School Certificate performance; they also include correlations with the best five Higher School Certificate subjects as a measure of overall matriculation performance. For Tasmania separate correlations (Tables 9 and 9A) are shown for levels 3 and 2 of each Higher School Certificate subject, level 3 being the highest level in a subject there. For the Australian Capital Territory, levels in a subject were not considered separately.

The Western Australian correlations in Table 10 tend to be lower than would have been the case had they been based on the full range of school leavers, due to the fact that university entrants represent a truncated distribution of abilities. Anderson demonstrated this by calculating fresh correlations based on all 1109 of the West Australian university entrants plus a random sample of 450 non-entrants selected from the lower ranges of performance.[2] This had the effect of noticeably increasing most correlations. The new correlations, which are shown in Table 10A, are more comparable with those for school leavers in the Australian Capital Territory and Tasmania than the correlations in Table 10.

Correlations of T.E.E.P. total score with matriculation performance have also been reported from Queensland and Victoria, but only for specialised small groups that are not representative of the matriculation populations in those States. These are shown in Table 11.

It is interesting to arrange the correlations between T.E.E.P. papers and matriculation subjects in rank order for each T.E.E.P. paper, as shown in Table 12. This enables the reader to see at a quick glance whether certain matriculation subjects or groups of subjects correlate as might be expected with certain T.E.E.P. papers. It can be seen that matriculation mathematics and sciences correlate reasonably well, and better than the non-science subjects, with T.E.E.P. papers 1 and 2 (quantitative; physical and biological sciences) in all States, although in Tasmania the correlations are noticeably lower than in

the other States. A disappointment is Biology in Western Australia, which correlates only 0.27 with T.E.E.P. paper 2 and does not rate a mention in Table 12 since only the top seven rankings are shown. For T.E.E.P. paper 3 (essays) the most prominent correlations are, as might be expected, with English, History, Economics and Geography. Western Australia again provides a surprise with Geology (0.48) heading the list of correlations with the T.E.E.P. essay paper and Chemistry (0.38) also prominent. For T.E.E.P. papers 4 and 5 (social sciences; art, literature and humanities) no clear pattern of correlations with matriculation subjects is evident, apart from consistently high correlations with English in the Australian Capital Territory and Western Australia. (All the correlations for Western Australia in Table 12 have been taken from Table 10A, since, as explained above, the latter figures provide a more reasonable comparison with school leavers in the other two States.)

Although the intercorrelation matrix for the Australian Capital Territory (Table 8) suggests many fascinating relationships, it is not intended in this report to speculate at length on the issue of T.E.E.P. versus teachers' estimates as predictors of matriculation performance. However, for the sake of interest, it may be noted that T.E.E.P. paper 3 (essays) correlates better than teachers' estimates with H.S.C. English, but teachers' estimates correlate better than T.E.E.P. papers 1 and 2 (quantitative and sciences) with H.S.C. Mathematics and Science respectively.

When considering the relationship between T.E.E.P. and matriculation performance it is as well to bear in mind a few words of caution from Tasmania : "The T.E.E.P. tests were not designed to provide equivalent measures to the matriculation examinations, but rather to provide valid predictors of tertiary success. Thus the final evaluation of the tests does not depend, for instance, on the correlation between Paper 1 and matriculation Mathematics A results, but rather on the correlation between Paper 1 and students' subsequent performance at a tertiary level." [3]

TABLE 8 INTERCORRELATIONS BETWEEN T.E.E.P. SCORES, HIGHER SCHOOL CERTIFICATE SCORES AND TEACHERS' ESTIMATES OF HIGHER SCHOOL CERTIFICATE SCORES

1968 SCHOOL LEAVERS — AUSTRALIAN ~~NATIONAL UNIVERSITY~~ CAPITAL TERRITORY

	T.E.E.P. SCORES					H.S.C. PERFORMANCE								TEACHERS' ESTIMATES OF H.S.C. PERFORMANCE						
	T.E.E.P. Paper 2	T.E.E.P. Paper 3	T.E.E.P. Paper 4	T.E.E.P. Paper 5	T.E.E.P. Total	H.S.C. English	H.S.C. Maths.	H.S.C. Science	H.S.C. History	H.S.C. Geography	H.S.C. Economics	H.S.C. Languages	H.S.C. Best Five	English Est.	Maths. Est.	Science Est.	History Est.	Geography Estimate	Economics Estimate	Languages Estimate
T.E.E.P. Paper 1.	0.69** 799	0.22** 775	0.48** 751	0.34** 748	0.70** 721	0.24** 792	0.62** 713	0.63** 647	0.14** 556	0.22** 424	0.30** 340	0.24** 380	0.51** 793	0.15** 793	0.48** 716	0.55** 647	0.05 558	0.10* 424	0.08 342	0.25** 375
T.E.E.P. Paper 2		0.35** 780	0.63** 763	0.50** 760	0.81** 721	0.38** 805	0.63** 725	0.66** 658	0.18** 564	0.21** 436	0.36** 350	0.32** 380	0.59** 806	0.28** 806	0.48** 728	0.58** 658	0.15** 566	0.14** 436	0.18** 352	0.29** 375
T.E.E.P. Paper 3			0.50** 734	0.55** 731	0.69** 721	0.66** 774	0.28** 698	0.29** 631	0.35** 545	0.31** 411	0.40** 328	0.36** 375	0.57** 775	0.49** 776	0.23** 700	0.30** 631	0.24** 547	0.22** 411	0.22** 330	0.34** 369
T.E.E.P. Paper 4				0.67** 775	0.84** 722	0.59** 775	0.47** 701	0.51** 635	0.27** 542	0.27** 419	0.44** 340	0.38** 370	0.63** 775	0.43** 776	0.35** 703	0.46** 635	0.16** 543	0.16** 418	0.21** 342	0.34** 364
T.E.E.P. Paper 5					0.78** 722	0.61** 771	0.39** 698	0.40** 633	0.31** 541	0.24** 416	0.38** 339	0.44** 367	0.60** 771	0.43** 771	0.31** 699	0.39** 633	0.19** 542	0.18** 415	0.20** 341	0.43** 361
T.E.E.P. Total						0.64** 716	0.60** 650	0.63** 588	0.32** 504	0.32** 379	0.48** 308	0.43** 347	0.74** 716	0.45** 717	0.46** 652	0.57** 588	0.19** 505	0.21** 378	0.22** 310	0.43** 341
H.S.C. English							0.37** 738	0.36** 669	0.46** 577	0.35** 444	0.51** 356	0.52** 391	0.75** 823	0.58** 822	0.26** 740	0.35** 668	0.23** 579	0.18** 443	0.27** 357	0.41** 386
H.S.C. Mathematics								0.84** 605	0.24** 497	0.31** 403	0.43** 336	0.43** 327	0.77** 739	0.39** 739	0.74** 737	0.70** 605	0.25** 499	0.22** 401	0.27** 334	0.43** 323
H.S.C. Science									0.40** 437	0.50** 374	0.43** 291	0.42** 278	0.74** 670	0.38** 669	0.63** 606	0.76** 669	0.14** 438	0.16** 373	0.14* 292	0.43** 273
H.S.C. History										0.60** 293	0.59** 224	0.27** 279	0.55** 578	0.26** 578	0.15** 498	0.24** 436	0.16** 575	0.15* 294	0.20** 225	0.21** 276
H.S.C. Geography											0.81** 211	0.42** 127	0.52** 444	0.19** 444	0.22** 404	0.23** 374	0.21** 296	0.22** 439	0.33** 212	0.33** 172
H.S.C. Economics												0.18 82	0.70** 357	0.47** 357	0.23** 336	0.27** 290	0.07 222	0.18* 210	0.26** 357	0.13 80
H.S.C. Languages													0.72** 392	0.26** 391	0.43** 328	0.44** 277	0.05 279	-0.01 127	-0.08 83	0.79** 383
H.S.C. Best Five														0.50** 823	0.59** 641	0.65** 669	0.25** 580	0.26** 443	0.32** 358	0.61** 387
English Estimate															0.33** 742	0.38** 664	0.50** 580	0.60** 444	0.19** 359	0.30** 386
Mathematics Estimate																0.86** 606	0.63** 500	0.79** 402	0.56** 338	0.49** 324
Science Estimate																	0.70** 437	0.76** 374	0.67** 292	0.48** 272
History Estimate																		0.94** 295	0.84** 223	0.10 276
Geography Estimate																			0.95** 212	0.05 126
Economics Estimate																				-0.01 80

* significant at the 5% level ** significant at the 1% level

Note 1 : Where a student attempted both Ancient and Modern History the two scores were averaged.

Note 2 : Where a student attempted more than one language the scores of all languages were averaged.

Note 3 : Description of T.E.E.P. tests

Paper 1 -- Quantitative, Paper 2 -- Physical and biological sciences, Paper 3 -- Essays

Paper 4 -- Social sciences, Paper 5 -- Art, literature, humanities.

TABLE 9. CORRELATIONS BETWEEN T.E.E.P. SCORES AND HIGHER SCHOOL CERTIFICATE SCORES

1968 SCHOOL LEAVERS TASMANIA

H.S.C. Subject - Level 3	T.E.E.P. Paper 1	T.E.E.P. Paper 2	T.E.E.P. Paper 3	T.E.E.P. Paper 4	T.E.E.P. Paper 5	T.E.E.P. Total
Ancient History				0.31	0.31	0.36
Art						
Biology	0.30	0.41		0.37	0.34	0.49
Chemistry	0.38	0.33				0.39
Economics	0.32	0.33		0.39	0.36	0.48
English Literature			0.40	0.43	0.41	0.50
French				0.34	0.40	0.43
Geography			0.38	0.31		0.38
Geology						
German						
Italian						
Latin			0.37		0.54	0.61
Mathematics A	0.36	0.34				0.34
Mathematics B	0.33					
Modern History			0.40	0.31		0.38
Matriculation Music					0.31	0.37
Physics	0.44	0.43				0.43

Note 1 : Only correlations significant at the 1% level and at least 0.30 have been reported, but numbers for each correlation have not been reported from Tasmania.

Note 2 : In Tasmania level 3 is the highest level in a subject.

Note 3 : Description of T.E.E.P. tests

Paper 1 - Quantitative, Paper 2 - Physical & biological sciences

Paper 3 - Essays, Paper 4 - Social sciences

Paper 5 - Art, literature, humanities.

TABLE 9A. CORRELATIONS BETWEEN T.E.E.P. SCORES AND HIGHER SCHOOL CERTIFICATE SCORES

1968 SCHOOL LEAVERS TASMANIA

H.S.C. Subject - Level 2	T.E.E.P. Paper 1	T.E.E.P. Paper 2	T.E.E.P. Paper 3	T.E.E.P. Paper 4	T.E.E.P. Paper 5	T.E.E.P. Total
Ancient History			0.49			
Art						
Biology		0.41	0.32	0.50	0.43	0.55
Chemistry	0.30					0.35
Economics						
English Literature			0.39			0.32
French		0.31		0.39		0.45
Geography						
Geology						
German						
Italian						
Latin						
Mathematics A						
Mathematics B						
Modern History			0.40		0.39	0.46
Matriculation Music						
Physics		0.45				0.35

Note 1 : Only correlations significant at the 1% level and at least 0.30 have been reported, but numbers for each correlation have not been reported from Tasmania.

Note 2 : In Tasmania level 3 is the highest level in a subject.

Note 3 : Description of T.E.E.P. tests

Paper 1 - Quantitative, Paper 2 - Physical & biological sciences

Paper 3 - Essays, Paper 4 - Social sciences

Paper 5 - Art, literature, humanities.

TABLE 10. CORRELATIONS BETWEEN T.E.E.P. SCORES AND LEAVING CERTIFICATE SCORES

1969 UNIVERSITY ENTRANTS UNIVERSITY OF WESTERN AUSTRALIA

(Students who sat for T.E.E.P. tests in 1968 as school leavers)

Leaving Certificate Subject	T.E.E.P. Paper 1	T.E.E.P. Paper 2	T.E.E.P. Paper 3	T.E.E.P. Paper 4	T.E.E.P. Paper 5
Biology	0.17	0.22**	0.19**	0.10	0.15
Chemistry (Old)	0.35**	0.36**	0.07	0.28**	0.23**
Chemistry (New)	0.48**	0.46**	0.31	0.31	0.01
Economics	-0.03	0.06	0.18**	0.22**	0.17**
English	0.26**	0.39**	0.38**	0.60**	0.55**
French	0.06	0.12	0.21**	0.18**	0.22**
Geography	0.11	0.09	0.20**	0.19**	0.13
Geology	0.28	-0.21	-0.01	0.24	-0.45
German	-0.05	0.02	0.16	0.09	0.18
History	-0.03	0.01	0.31**	0.18**	0.19**
Italian	0.10	0.01	-0.23	-0.18	-0.21
Latin	0.06	0.22	0.07	0.37**	0.22
Mathematics A	0.48**	0.43**	0.09	0.22**	0.11
Mathematics B	0.44**	0.40**	0.05	0.22**	0.12**
Mathematics (General)	0.19	0.27**	0.04	0.08	0.14
Music B	0.09	0.32**	-0.14	0.25	0.23
Physics	0.46**	0.45**	0.11	0.32**	0.21**

** significant at the 1% level. (Although numbers have not been reported, significance levels have been provided by the University of W.A.)

Note 1 : The total number of entrants is 1109; numbers for each correlation have not been reported from Western Australia.

Note 2 : Description of T.E.E.P. tests

Paper 1 - Quantitative, Paper 2 - Physical & biological sciences,

Paper 3 - Essays, Paper 4 - Social sciences,

Paper 5 - Art, literature, humanities.

TABLE 10A. CORRELATIONS BETWEEN T.E.E.P. SCORES AND LEAVING CERTIFICATE SCORES

1969 UNIVERSITY ENTRANTS PLUS RANDOM SAMPLE OF NON-ENTRANTS (see Note 1)

UNIVERSITY OF WESTERN AUSTRALIA

(Students who sat for T.E.E.P. tests in 1968 as school leavers)

Leaving Certificate Subject	T.E.E.P. Paper 1	T.E.E.P. Paper 2	T.E.E.P. Paper 3	T.E.E.P. Paper 4	T.E.E.P. Paper 5
Biology	0.18**	0.27**	0.05**	0.21**	0.22**
Chemistry (Old)	0.42**	0.40**	0.22**	0.37**	0.35**
Chemistry (New)	0.57**	0.61**	0.38**	0.09	0.28
Economics	0.04	0.15**	0.31**	0.34**	0.27**
English	0.27**	0.40**	0.44**	0.61**	0.57**
French	0.06	0.14	0.18**	0.22**	0.21**
Geography	0.24**	0.22**	0.34**	0.29**	0.27**
Geology	0.45	0.54	0.48	0.40	
German	0.01	0.09	0.20	0.15	0.23
History	0.07	0.10	0.40**	0.30**	0.27**
Italian	0.29	0.21	0.00	0.08	0.00
Latin	0.10	0.34**	0.10	0.48**	0.26
Mathematics A	0.52**	0.48**	0.21**	0.33**	0.21**
Mathematics B	0.48**	0.45**	0.22**	0.34**	0.24**
Mathematics (General)	0.27**	0.35**	0.21**	0.24**	0.26**
Music B	0.01	0.28**	-0.04	0.26**	0.04
Physics	0.50**	0.49**	0.26**	0.40**	0.30**

** significant at the 1% level. (Although numbers have not been reported, significance levels have been provided by the University of W.A.)

Note 1 : The total number of cases is 1559, consisting of the 1109 entrants in Table 10 plus 450 non-entrants randomly selected from the lower ranges of performance; numbers for each correlation have not been reported.

Note 2 : Description of T.E.E.P. tests

Paper 1 - Quantitative, Paper 2 - Physical & biological sciences,

Paper 3 - Essays, Paper 4 - Social sciences,

Paper 5 - Art, literature, humanities.

TABLE 11. CORRELATIONS BETWEEN T.E.E.P. TOTAL SCORE AND MATRICULATION PERFORMANCE FOR SPECIALISED GROUPS IN QUEENSLAND AND VICTORIA

	QUEENSLAND			VICTORIA
	Matriculation Total Score			Best 3 Matriculation subjects
	1st year Dentistry 1969	1st year Medicine 1969	1st year Social Work 1969	All Residential University College Applicants, 1968
	Numbers in samples are shown in brackets			
T.E.E.P. Total Score	0.36 (23)	0.54 (162)	-0.11 (49)	0.54 (447)

TABLE 12. CORRELATIONS BETWEEN T.E.E.P. SCORES AND MATRICULATION SUBJECT SCORES ARRANGED IN DESCENDING ORDER FOR EACH T.E.E.P. PAPER

1968 SCHOOL LEAVERS — AUSTRALIAN CAPITAL TERRITORY, TASMANIA AND WESTERN AUSTRALIA (see Note below)

T.E.E.P. PAPER 1 (Quantitative)						T.E.E.P. PAPER 2 (Physical & biological sciences)					
A.C.T.		TAS.		W.A.		A.C.T.		TAS.		W.A.	
Science	.63	Physics level 3	.44	Chemistry (new)	.57	Science	.66	Physics level 2	.45	Chemistry (new)	.61
Maths.	.62	Chemistry level 3	.38	Maths. A	.52	Maths.	.63	Physics level 3	.43	Geology	.54
Economics	.30	Maths. A level 3	.36	Physics	.50	English	.38	Biology level 3	.41	Physics	.49
Languages	.24	Maths. B level 3	.33	Maths. B	.48	Economics	.36	Biology level 2	.41	Maths. A	.48
English	.24	Economics level 3	.32	Geology	.45	Languages	.32	Maths. A level 3	.34	Maths. B	.45
Geography	.22	Biology level 3	.30	Chemistry (old)	.42	Geography	.21	Chemistry level 3	.33	Chemistry (old)	.40
History	.14	Chemistry level 2	.30	Italian	.29	History	.18	Economics level 3	.33	English	.40

Note : The Western Australian correlations are not, strictly speaking, for school leavers, but are taken from Table 10A. (See text - page 31.)

TABLE 12. CONTINUED

T.E.E.P. Paper 3 (Essays)						T.E.E.P. PAPER 4 (Social sciences)					
A.C.T.		TAS.		W.A.		A.C.T.		TAS.		W.A.	
English	.66	Ancient History level 2	.49	Geology	.48	English	.59	Biology level 2	.50	English	.61
Economics	.40	English literature level 3	.40	English	.44	Science	.51	English literature level 3	.43	Latin	.48
Languages	.36	Modern History level 2	.40	History	.40	Maths.	.47	French level 2	.39	Geology	.40
History	.35	Modern History level 3	.40	Chemistry (new)	.38	Economics	.45	Economics level 3	.39	Physics	.40
Geography	.31	English Literature level 2	.39	Geography	.34	Languages	.38	Biology level 3	.37	Chemistry (old)	.37
Science	.29	Geography level 3	.38	Economics	.31	History	.27	French level 3	.34	Economics	.34
Maths.	.28	Latin level 3	.37	Physics	.26	Geography	.27	Modern History level 3	.31	Maths. B	.34

T.E.E.P. PAPER 5 (Art, literature, humanities)					
A.C.T.		TAS.		W.A.	
English	.61	Latin level 3	.54	English	.57
Languages	.44	Biology level 2	.43	Chemistry (old)	.35
Science	.40	English Literature level 3	.41	Physics	.30
Maths.	.39	French level 3	.40	Chemistry (new)	.28
Economics	.38	Modern History level 2	.39	History	.27
History	.31	Economics level 3	.36	Geography	.27
Geography	.24	Biology level 3	.34	Economics	.27

PREDICTION OF UNIVERSITY PERFORMANCE

The principal interest in the Tertiary Education Entrance Project lies in the extent to which the tests can select those students most likely to succeed in a course of tertiary education. In recent years there has been mounting dissatisfaction with traditional final year school examinations as tertiary selection devices, and hopes have been expressed that something more suitable might be found. Alternatives under serious consideration at the moment include ability tests of the kind demonstrated in T.E.E.P., content-based achievement tests and the judgment of teachers.

An important methodological issue is that of how best to consider the whole question of tertiary prediction and to evaluate the various alternatives that have been proposed. It has become customary to rely perhaps too heavily on the correlational model, as if correlations had the last word in this type of analysis, although it is well known that for a variety of reasons correlations tend to be low in tertiary predictive studies, not the least of which is erratic performance in the upper ranges of ability and truncation of the lower ranges. It might also be objected that many correlations, including some of those reported here, are highly suspect because of the way in which scores on quite different measures are assumed to be equivalent measures on the same variable; this is especially true for such heterogeneous groupings as "best five subjects" and "all faculties combined", and for overall performance within such faculties as Arts and Science in which a diverse range of subjects may be studied.

At best, correlations can only predict the order in which candidates on a predictor variable, such as T.E.E.P. or matriculation performance, will sort themselves out on a criterion variable, such as university performance, and purport to account for some of the variance in the latter. It is possible to have perfect correlation between two variables yet be unable to predict success on the one from the other; for example, a number of students could pass at matriculation yet all fail in exactly the same order at university. On the other hand it is possible to predict success yet have poor correlation if all the high scoring students at matriculation pass at university, and the low scoring ones fail, but in completely randomised order.

An alternative to the correlational model is to compare the mean T.E.E.P. and matriculation performances of students who pass and fail at university. This enables one to see whether performance on the predictor discriminates between success and failure on the criterion, regardless of the rank order

of performance on either. However, the statistical significance of the difference between means can be deceptively reassuring at times, especially if one fails to notice the overlap between the distributions, and the problem of predicting pass and fail at university on this basis is very much akin to guessing a person's sex from his (or her) height. The latter task would in fact be simpler because there is less overlap between the distributions for height.

Whichever way one looks at the evidence it is difficult to escape the conclusion that T.E.E.P. Series A was less successful than conventional matriculation in predicting university performance in 1969, although in fairness it must be admitted that neither of these measures gave much cause for satisfaction. From the viewpoint of correlations and percentage of variance accounted for, both predictors were disappointing but with matriculation showing to some advantage over T.E.E.P. On the other hand although T.E.E.P. and matriculation both discriminated reasonably well, in terms of statistical significance, between success and failure at university, there was a marked degree of overlap between the distributions of abilities for pass and fail students. Here again, matriculation appeared to discriminate slightly better than T.E.E.P. Ultimately one is forced to the conclusion that too many cases of university performance in this analysis have not been accounted for by any method of prediction.

Australian National University

The most comprehensive results available at this stage are those for the Australian National University and include correlations with university performance and comparisons for pass/fail dichotomies. The assessment of university performance upon which the correlations were calculated was based on a system of points scored in each subject as follows :

Fail	0 points	Pass Order of Merit Distinction	4 points
Pass	2 points		
Credit	3 points	High Distinction	5 points

Science students who failed a subject but who were awarded a pass on the year had one point added to their total score.

The range of points possible for a student who attempted four subjects extended from 0 to 20; for students who attempted other than four subjects the points were scaled to make them equivalent to points for a four subject course. For the purpose of the pass/fail comparisons, a faculty pass for full-time students was defined as passing more than half the subjects attempted; for part-time students it was passing at least half the subjects. (See page 12.)

The measures of matriculation performance were the scaled marks in each Higher School Certificate subject and the "best five" scaled mark awarded at the examination by the New South Wales Board of Senior School Studies. No account has been taken in this analysis of the separate levels in a subject and this could have some bearing on the results. (In New South Wales a candidate may sit for examination in a subject at one of three levels, the highest being level 1. The maximum mark obtainable for a level 1 paper is normally 180, but Science and Mathematics when taken at this level are each marked out of 270, and together may be considered equivalent to three subjects. Lower maximum marks are obtainable for level 2 and level 3 papers.)

Teachers' estimates were estimates of the likely attainments of candidates presenting themselves for the Higher School Certificate examination. This is not the same thing as estimating the result which a candidate "deserves" to attain or his potential for tertiary study. The distinction needs to be borne clearly in mind when considering the relevance of the teachers' estimates reported here to the general discussion of tertiary prediction. Other research studies based on teachers' judgments of a student's tertiary academic potential are known to be in progress, but the results are not yet available.

Table 13 gives correlations of first year university performance in 1969 with T.E.E.P. scores, Higher School Certificate performance and teachers' estimates of Higher School Certificate performance in 1968. Correlations are shown separately for full-time and part-time students, and those for the full-time students are further analysed by individual faculty.

In Tables 16 to 22, students who passed their first year at university are compared with those who failed. Comparisons are based on all T.E.E.P. papers and the Higher School Certificate subjects of Mathematics, Science and English (including teachers' estimates), since these subjects would be expected to have some prima facie correspondence with T.E.E.P. papers 1, 2 and 3 respectively. The aggregates of the best five Higher School Certificate subjects for the pass and fail groups at university are also compared. Table 16, which includes full-time and part-time students combined, gives an overall summary for the university as a whole, while Tables 17 to 22 analyse the same data for each faculty and for the part-time students separately.

The highest correlations between T.E.E.P. and university performance for full-time students in all faculties combined are 0.33 for T.E.E.P. total score and 0.32 for T.E.E.P. paper 5. Looking at each faculty separately, most

of the correlations between T.E.E.P. and university performance are quite low, generally of the order of 0.2 or less, the principal exceptions being 0.54 between T.E.E.P. paper 5 and Arts, 0.50 between T.E.E.P. total score and Arts, and 0.64 between T.E.E.P. paper 5 and Oriental Studies. (The last, though, is for only eleven candidates.) There is also a correlation of 0.35 between T.E.E.P. total score and Science. Arts is the only faculty for which correlations with most T.E.E.P. papers are at least as high as 0.3.

The aggregate of the best five Higher School Certificate subjects correlates 0.54 with university performance for full-time students in all faculties combined. Taking each faculty separately, Higher School Certificate and teachers' estimates correlate only slightly better than T.E.E.P. with first year performance in the faculty of Arts, but there is a noticeable improvement for the faculty of Science. In general, correlations of Higher School Certificate subjects and teachers' estimates with Arts and Science are of the order of 0.3 or 0.4, with several around 0.5 and 0.6. Among these are correlations of 0.62 and 0.65 between the best five Higher School Certificate subjects and first year Arts and Science respectively. For the remaining faculties - Economics, Law, Oriental Studies - and for the part-time students, however, there is little to choose between T.E.E.P., Higher School Certificate and teachers' estimates. (Regrettably, due to a programming oversight, correlations involving the best five teachers' estimates were not computed.)

There is some need for caution in comparing the correlations for T.E.E.P. with those for the Higher School Certificate and teachers' estimates given in Table 13. In the first place some matriculation subjects (languages, for instance) have no correspondence with any T.E.E.P. paper. Secondly, students normally elect to take those subjects at matriculation in which they are most interested or likely to succeed; this option was not available with the T.E.E.P. papers. It could be argued on this basis that matriculation has an unfair advantage in any comparison with T.E.E.P. as a predictor of university performance. In another study, yet to be reported, the writer has considered selections of the best T.E.E.P. papers by each candidate in place of T.E.E.P. total score, and has obtained separate correlations for different "streams" of students exercising certain options at matriculation, but they have not appreciably altered the picture as it appears in this report.

Correlations are also available between first year subject marks and performance on T.E.E.P. papers, individually and in combination, for a selection of university subjects. These are given in Tables 14 and 15. Generally speaking

they are not very impressive. There are a few subjects, such as Applied Mathematics I, which seem to correlate highly with any combination of T.E.E.P. papers, but for the majority no very efficient predictor combination has been found. However, sample sizes with individual university subjects are rather low and only a few possibilities have been explored at this stage.

Table 16 shows how well (or badly) certain predictor measures discriminate between students who passed and failed first year university in 1969, by testing the significance of the difference between their mean scores on each predictor. Table 16 includes students in all faculties, full-time and part-time, combined. The differences are significant at the 1% level (at least) for T.E.E.P. papers 3 and 5, Higher School Certificate English and the aggregate of the best five Higher School Certificate subjects. For T.E.E.P. total score the difference is significant at the 5% level. Teachers' estimates of matriculation English also discriminate between university pass and fail at a very high level of significance (0.1%). In order of significance the best discrimination is given by H.S.C. English, followed by teachers' estimated English, H.S.C. "best five" aggregate, T.E.E.P. paper 3 (essays), T.E.E.P. paper 5 (art, literature and humanities) and T.E.E.P. total. However the overlap between some of the distributions is quite considerable, and it is obvious that too many students of high ability must have failed, and vice-versa, for one to feel complacent about any of the predictor measures.

(Frequency distributions for T.E.E.P. papers based on pass/fail dichotomies are given in Table 2A and Figures 6 to 10 in an earlier section of this report. Distributions of other predictor measures have not been included, but the overlap can be reasonably well inferred from the means and standard deviations given in Tables 16 to 22.)

Looking at each faculty separately for comparison of students who passed and failed, the situation is much less encouraging. Most of the differences reported in Tables 17 to 22 are of no statistical significance, and many are so small as to be negligible. For example, in the faculty of Science there is virtually no difference at all in the calibre of pass and fail students as measured by mathematical and scientific predictors, whether these be T.E.E.P. papers 1 and 2 or Higher School Certificate Mathematics and Science. An exception to the general picture is the faculty of Law, where all predictor measures - apart from Higher School Certificate Science - seem to work quite well, although the number of fail students is too small to warrant any statistical inference. (The difference has not been tested when the number of cases in a group is less than

ten.) The only predictor that gives reasonable discrimination between the pass and fail groups for both of the largest faculties, Arts and Science, is the aggregate of the best five Higher School Certificate subjects. For Arts alone T.E.E.P. paper 5 and T.E.E.P. total score also give reasonable discrimination.

Some interesting details emerge when comparisons are made between faculties. The full-time Science students in this study who passed their first year at university in 1969 had the highest mean score (571.35) on the best five Higher School Certificate subjects. They were followed by Law (553.04) and Arts (552.07). However, on H.S.C. English, pass students in the faculties of Science and Economics, with means of 96.09 and 100.78 respectively, were below the standard of pass students in other faculties with mean scores between 111 and 115. Even students who failed in Arts had a substantially higher mean score on H.S.C. English (105.07) than those who passed in Science. Some disparities can probably be attributed to the different levels at which subjects may be taken for the Higher School Certificate in New South Wales. For example, one might expect to find a greater proportion of students sitting for level 1 English among those proceeding to university Arts than to Science. Nevertheless, similar trends are evident to some degree with T.E.E.P. scores.

If it is safe to reach any firm conclusion regarding the 1969 entrants to the Australian National University on the basis of the evidence available, it might be that Higher School Certificate English and the aggregate of the best five Higher School Certificate subjects were the most successful predictors of university performance. T.E.E.P. papers were erratic, and for some faculties a disappointment as with papers 1 and 2 (quantitative and scientific) for the faculty of Science. It is only fair to add that some matriculation papers were no less erratic and disappointing, including H.S.C. Mathematics and Science. The evidence has not permitted a proper assessment of the effects of motivation and willingness to take the T.E.E.P. tests, or of traditional teaching practice in preparing students for a more conventional, syllabus-based style of examination. Nor have university examinations and teaching practice been subjected to any scrutiny.

Further research now in progress, including factor analysis, multiple regression analysis and other multivariate studies could yield some worthwhile additional information, though it cannot hope to put into the data what it already lacks. A number of such studies has almost been completed by the writer and will be reported later as the opportunity permits.

Part-time students at the Australian National University

Because of the small number of part-time students (thirty one) who sat for T.E.E.P. tests in 1968 as school leavers, this group was considered as a whole rather than by separate faculties. Whether one looks at the correlations in Table 13 or the comparisons of mean scores for the pass/fail dichotomy in Table 22, the general picture for the part-time students seems to be more confused than for the full-time students. The only correlation with university performance found to be significant was 0.51 for Higher School Certificate Geography. In the comparisons between the pass and fail groups, Higher School Certificate Mathematics and Science each discriminated negatively at the 5% level of significance. (i.e. part-time students who passed their university course were significantly weaker on matriculation mathematics and science than those who failed.) Quite a few other negative, though non-significant, predictors can be found for this group of students among the correlations and comparisons in Tables 13 and 22. (Comparisons between full-time and part-time students on T.E.E.P. papers were presented in Table 6 in an earlier section of this report.)

University of Queensland

Correlations of first year performance in the faculties of Dentistry, Medicine and Social Work with T.E.E.P. total score and matriculation total score are shown in Table 23. It has been inferred from the Queensland report - though there is some doubt on this point - that the correlations have been based only on students who passed first year; if this is the case, they might have been higher had the performance of students who failed been taken into account.[4] A comparison of successful and unsuccessful students on the basis of their mean T.E.E.P. test scores is shown in Table 24. The latter comparison shows that students who passed and failed first year in the three faculties chosen for the experiment differred significantly on T.E.E.P. papers 2, 3 and 4, but not on T.E.E.P. papers 1 and 5 and T.E.E.P. total score. However, although the latter differences are not significant, the means of the successful students are marginally higher on all T.E.E.P. papers. (The Queensland sample was tested with T.E.E.P. during first year at university and its composition could have had some bearing on the results - see page 25.)

Queensland has also carried out a stepwise regression analysis from which it was concluded that for Dentistry and Medicine students "the role of T.E.E.P. was insignificant", although for Social Work students its contribution appeared to be quite substantial.[5]

University of Western Australia

Research on T.E.E.P. Series A reported from the University of Western Australia seems to have focussed on T.E.E.P. and other measures in relation to performance in individual university subjects as distinct from overall performance in each faculty as a whole. Thus it is difficult to draw direct comparisons with findings reported from the Australian Capital Territory and Queensland. Nevertheless the extensive correlations presented in Tables 25 and 26 fill a gap which has not been adequately covered in T.E.E.P. research reported from other sources, except to a limited extent at the Australian National University as shown in Tables 14 and 15. These are correlations of Leaving Certificate and T.E.E.P. papers with individual first year subject marks in Arts, Social Science and Science courses at the University of Western Australia. Anderson has also obtained correlations of intelligence and reading test scores with first year subject performance, and comments that "in general, although T.E.E.P., Intelligence and Reading tests show significant correlations with a number of variables, better predictions could be made from Leaving scores, although one might debate whether the higher predictive efficiency warrants the extra effort." [6] (The latter correlations have not been included in this report.)

TABLE 13. CORRELATIONS OF FIRST YEAR UNIVERSITY PERFORMANCE WITH T.E.E.P. SCORES, HIGHER SCHOOL CERTIFICATE PERFORMANCE AND TEACHERS' ESTIMATES OF HIGHER SCHOOL CERTIFICATE PERFORMANCE

1969 UNIVERSITY ENTRANTS AUSTRALIAN NATIONAL UNIVERSITY

(All students who sat for T.E.E.P. tests in 1968 as school leavers)

	1ST YEAR UNIVERSITY PERFORMANCE						
	Full-time Students					Full-time Students - all faculties combined	Part-time Students - all faculties combined
	Arts	Economics	Law	Oriental Studies	Science		
	Numbers in samples are shown in brackets						
T.E.E.P. Paper 1 (Quantitative)	0.23* (79)	0.13 (22)	0.09 (26)	0.23 (11)	0.20 (64)	0.10 (202)	0.15 (31)
T.E.E.P. Paper 2 (Phys. & biol. sciences)	0.29** (79)	0.14 (23)	-0.02 (26)	0.24 (11)	0.23 (65)	0.14* (204)	-0.17 (31)
T.E.E.P. Paper 3 (Essays)	0.30** (78)	0.07 (23)	0.13 (24)	0.10 (11)	0.20 (64)	0.23** (200)	0.21 (31)
T.E.E.P. Paper 4 (Social sciences)	0.35** (76)	0.19 (24)	-0.05 (26)	0.19 (11)	0.24 (65)	0.24** (202)	-0.05 (30)
T.E.E.P. Paper 5 (Art, literature, humanities)	0.54** (73)	0.26 (24)	-0.01 (27)	0.64* (11)	0.22 (64)	0.32** (199)	-0.05 (30)
T.E.E.P. Total (All five papers)	0.50** (71)	0.26 (22)	0.14 (24)	0.41 (10)	0.35** (61)	0.33** (188)	0.05 (30)
H.S.C. English	0.30** (80)	0.39* (25)	0.43* (26)	0.60* (12)	0.40** (68)	0.40** (211)	0.21 (31)
H.S.C. Mathematics	0.30* (67)	0.30 (25)	0.31 (24)		0.32** (68)	0.21** (190)	-0.35 (28)
H.S.C. Science	0.32* (45)	0.14 (22)	-0.29 (19)		0.45** (68)	0.18* (160)	-0.39 (24)
H.S.C. History	0.44** (59)	0.25 (14)	0.01 (18)	0.57 (11)	0.57** (29)	0.46** (131)	0.11 (23)
H.S.C. Geography	0.29 (34)	-0.01 (13)			0.20 (28)	0.15 (85)	0.51* (15)
H.S.C. Economics	0.53** (23)	0.15 (16)	0.00 (12)		0.36 (16)	0.22 (67)	0.46 (10)
H.S.C. Languages	0.37** (62)	0.54 (11)	0.13 (14)	0.20 (12)	0.48** (36)	0.39** (135)	-0.06 (18)
H.S.C. "Best Five"	0.62** (80)	0.40* (25)	0.22 (26)	0.78** (12)	0.65** (68)	0.54** (211)	-0.09 (31)
English Estimate	0.29** (80)	0.31 (25)	0.42* (26)	0.77** (12)	0.36** (68)	0.38** (211)	0.14 (31)
Mathematics Estimate	0.37** (68)	0.53** (25)	0.23 (24)		0.39** (68)	0.31** (191)	-0.27 (28)
Science Estimate	0.45** (45)	-0.07 (22)	-0.04 (19)		0.40** (68)	0.22** (160)	-0.31 (24)
History Estimate	0.35** (59)	0.15 (14)	0.17 (18)	0.52 (11)	0.29 (30)	0.33** (132)	0.29 (23)
Geography Estimate	0.20 (34)	0.22 (13)			-0.33 (28)	0.06 (86)	0.47 (15)
Economics Estimate	0.58** (23)	-0.07 (16)	0.02 (12)		0.52* (16)	0.22 (67)	0.42 (10)
Languages Estimate	0.25 (62)	0.14 (11)	0.28 (13)	0.75** (12)	0.39* (35)	0.34** (133)	0.22 (18)

* significant at the 5% level ** significant at the 1% level

Note 1 : Law includes Law, Arts/Law and Economics/Law.

Note 2 : Correlations for cases less than 10 are not given.

Note 3: Where more than one language was taken, scores were averaged.

TABLE 14. CORRELATIONS BETWEEN T.E.E.P. SCORES AND FIRST YEAR SUBJECT MARKS

1969 UNIVERSITY ENTRANTS AUSTRALIAN NATIONAL UNIVERSITY

(Full-time students who sat for T.E.E.P. tests in 1968 as school leavers).

	T.E.E.P. Paper 1	T.E.E.P. Paper 2	T.E.E.P. Paper 3	T.E.E.P. Paper 4	T.E.E.P. Paper 5	T.E.E.P. Total
	Numbers in samples are shown in brackets					
Psychology I	0.34* (45)	0.18 (46)	0.26 (45)	0.19 (45)	0.35* (45)	0.39** (44)
Legal Method	0.73** (23)	0.44* (23)	0.18 (23)	0.65** (23)	0.29 (23)	0.66** (22)
Legal and Constitutional History	0.59** (19)	0.50* (19)	0.18 (19)	0.42 (19)	0.19 (19)	0.48* (18)
Pure Maths. I	0.56** (62)	0.49** (63)	0.27* (63)	0.39** (61)	0.42** (60)	0.57** (58)
Applied Maths.I	0.69** (15)	0.45 (15)	0.44 (15)	0.52* (16)	0.32 (16)	0.69** (15)
General Chemistry	-0.19 (22)	-0.04 (23)	0.41* (22)	0.43* (24)	0.37 (24)	0.28 (22)
Chemistry I	0.33 (33)	0.31 (33)	0.02 (33)	0.06 (32)	0.05 (31)	0.23 (31)
Geology I	0.25 (22)	0.34 (22)	0.20 (22)	0.19 (21)	0.44* (21)	0.44* (21)
Physics I	0.43 (16)	0.44 (16)	0.26 (16)	0.47 (15)	0.45 (15)	0.56* (15)
Botany I	-0.05 (21)	-0.03 (22)	-0.04 (21)	0.12 (23)	-0.02 (22)	-0.02 (20)
Zoology I	0.19 (27)	0.22 (28)	-0.07 (27)	0.15 (29)	0.11 (29)	0.14 (27)
Political Science I	0.10 (36)	0.24 (36)	0.48** (36)	0.51** (36)	0.50** (36)	0.49** (35)
Introduction to Philosophy & Logic	0.23 (29)	0.12 (29)	-0.08 (29)	-0.02 (29)	-0.17 (28)	0.03 (28)
Ancient History	0.05 (31)	0.00 (31)	0.40* (30)	0.27 (30)	0.46* (31)	0.43* (29)
English Literature I	0.38** (49)	0.49** (49)	0.24 (48)	0.41** (48)	0.39** (47)	0.57** (46)
Asian Civilisation	0.35 (21)	0.44* (21)	0.49* (21)	0.60** (21)	0.75** (21)	0.67** (19)

* significant at the 5% level ** significant at the 1% level

Note : Description of T.E.E.P. tests

Paper 1 - Quantitative, Paper 2 - Physical & biological sciences,

Paper 3 - Essays, Paper 4 - Social sciences,

Paper 5 - Art, literature, humanities.

TABLE 15. CORRELATIONS BETWEEN 1ST YEAR SUBJECT MARKS AND COMBINATIONS OF T.E.E.P. PAPERS

1969 UNIVERSITY ENTRANTS AUSTRALIAN NATIONAL UNIVERSITY

(Full-time students who sat for T.E.E.P. tests in 1968 as school leavers)

	T.E.E.P. Best 3	T.E.E.P. 1, 4 & 5	T.E.E.P. 1 & 2	T.E.E.P. 1, 2 & 3	T.E.E.P. 3, 4 & 5
	Numbers in samples are shown in brackets				
Psychology I	0.39** (46)	0.29 (46)	0.28 (46)	0.32* (46)	0.29 (46)
Legal Method	0.66** (23)	0.64** (23)	0.62** (23)	0.48* (23)	0.44* (23)
Legal and Constitutional History	0.54* (19)	0.46* (19)	0.56* (19)	0.47* (19)	0.33 (19)
Pure Maths. 1	0.55** (64)	0.49** (64)	0.55** (63)	0.53** (63)	0.41** (64)
Applied Maths. 1	0.75** (16)	0.76** (16)	0.69** (15)	0.66** (15)	0.64** (16)
General Chemistry	0.21 (24)	0.34 (24)	-0.04 (23)	0.13 (23)	0.48* (24)
Chemistry I	0.32 (33)	0.12 (33)	0.35* (33)	0.33 (33)	0.01 (33)
Geology I	0.45* (22)	0.08 (22)	0.34 (22)	0.42 (22)	0.09 (22)
Physics I	0.56* (16)	0.44 (16)	0.47 (16)	0.54* (16)	0.39 (16)
Botany I	0.10 (23)	0.01 (23)	-0.05 (22)	-0.05 (22)	0.01 (23)
Zoology I	0.35 (29)	0.32 (29)	0.28 (28)	0.22 (28)	0.25 (29)
Political Science I	0.53** (37)	0.46** (37)	0.18 (36)	0.36* (36)	0.57** (37)
Introduction to Philosophy & Logic	-0.02 (29)	0.00 (29)	0.19 (29)	0.12 (29)	-0.14 (29)
Ancient History	0.26 (32)	0.17 (32)	0.03 (31)	0.30 (31)	0.29 (32)
English Literature I	0.53** (49)	0.39** (49)	0.49** (49)	0.57** (49)	0.34* (49)
Asian Civilization	0.57** (23)	0.45* (23)	0.45* (21)	0.52* (21)	0.45* (23)

* significant at the 5% level ** significant at the 1% level

Note : Description of T.E.E.P. tests

Paper 1 - Quantitative, Paper 2 - Physical & biological sciences,

Paper 3 - Essays, Paper 4 - Social sciences,

Paper 5 - Art, literature, humanities.

TABLE 16. COMPARISON BETWEEN STUDENTS WHO PASS AND FAIL 1ST YEAR UNIVERSITY MEANS AND STANDARD DEVIATIONS FOR T.E.E.P. PAPERS (STANDARD SCORES), HIGHER SCHOOL CERTIFICATE PERFORMANCE AND TEACHERS' ESTIMATES OF HIGHER SCHOOL CERTIFICATE PERFORMANCE

1969 UNIVERSITY ENTRANTS AUSTRALIAN NATIONAL UNIVERSITY

(All students who sat for T.E.E.P. tests in 1968 as school leavers)

		Pass	Fail	z	Significance of difference between pass and fail
T.E.E.P. Tests					
T.E.E.P. Paper 1 (Quantitative)	Mean	54.56	55.10	-0.34	N.S.
	Std.dvn.	11.34	10.75		
	Number	170	63		
T.E.E.P. Paper 2 (Phys. & biol. sciences)	Mean	54.92	55.61	-0.45	N.S.
	Std.dvn.	12.32	9.73		
	Number	171	64		
T.E.E.P. Paper 3 (Essays)	Mean	55.56	50.43	3.28	0.1% level
	Std.dvn.	11.02	10.41		
	Number	168	63		
T.E.E.P. Paper 4 (Social sciences)	Mean	55.48	53.23	1.71	N.S.
	Std.dvn.	10.81	8.22		
	Number	167	65		
T.E.E.P. Paper 5 (Art, literature, humanities)	Mean	55.95	51.20	2.87	1% level
	Std.dvn.	11.33	11.22		
	Number	165	64		
T.E.E.P. Total (All five papers)	Mean	277.34	263.93	2.43	5% level
	Std.dvn.	40.85	34.35		
	Number	159	59		
H.S.C. Subjects					
H.S.C. English	Mean	105.98	90.18	5.31	0.1% level
	Std.dvn.	20.50	21.20		
	Number	172	70		
H.S.C. Mathematics	Mean	132.04	134.48	-0.36	N.S.
	Std.dvn.	50.30	44.02		
	Number	154	64		
H.S.C. Science	Mean	138.65	146.50	-1.21	N.S.
	Std.dvn.	50.09	35.35		
	Number	128	56		
Best five subjects	Mean	548.80	509.80	3.45	0.1% level
	Std.dvn.	100.76	69.27		
	Number	172	70		
Teachers' Estimates					
English Estimate	Mean	99.95	86.24	4.77	0.1% level
	Std.dvn.	23.08	19.09		
	Number	172	70		
Mathematics Estimate	Mean	111.16	106.80	0.69	N.S.
	Std.dvn.	45.69	41.48		
	Number	155	64		
Science Estimate	Mean	116.74	116.07	0.09	N.S.
	Std.dvn.	52.26	41.05		
	Number	128	56		

TABLE 17. COMPARISON BETWEEN STUDENTS WHO PASS AND FAIL IN THE FACULTY OF ARTS MEANS AND STANDARD DEVIATIONS FOR T.E.E.P. PAPERS (STANDARD SCORES), HIGHER SCHOOL CERTIFICATE PERFORMANCE AND TEACHERS' ESTIMATES OF HIGHER SCHOOL CERTIFICATE PERFORMANCE

1969 UNIVERSITY ENTRANTS AUSTRALIAN NATIONAL UNIVERSITY

(Full-time students who sat for T.E.E.P. tests in 1968 as school leavers)

		Pass	Fail	t	Significance of difference between pass and fail
T.E.E.P. Tests					
T.E.E.P. Paper 1 (Quantitative)	Mean	49.89	46.93	0.93	N.S.
	Std.dvn.	11.18	8.35		
	Number	65	14		
T.E.E.P. Paper 2 (Phys. & biol. sciences)	Mean	51.58	49.21	0.78	N.S.
	Std.dvn.	10.83	7.43		
	Number	65	14		
T.E.E.P. Paper 3 (Essays)	Mean	58.92	53.71	1.75	N.S.
	Std.dvn.	9.66	12.05		
	Number	64	14		
T.E.E.P. Paper 4 (Social sciences)	Mean	54.87	53.00	0.57	N.S.
	Std.dvn.	11.47	8.62		
	Number	62	14		
T.E.E.P. Paper 5 (Art, literature, humanities)	Mean	57.42	48.77	2.88	1% level
	Std.dvn.	9.95	9.06		
	Number	60	13		
T.E.E.P. Total (All five papers)	Mean	274.14	250.77	2.08	5% level
	Std.dvn.	36.03	38.91		
	Number	58	13		
H.S.C. Subjects					
H.S.C. English	Mean	111.33	105.07	1.33	N.S.
	Std.dvn.	16.06	19.70		
	Number	66	14		
H.S.C. Mathematics	Mean	115.20	95.76	1.60	N.S.
	Std.dvn.	41.19	29.28		
	Number	54	13		
H.S.C. Science	Mean	110.65	108.00	Difference not tested	
	Std.dvn.	48.11	30.50		
	Number	40	5		
Best five subjects	Mean	552.07	492.92	4.00	0.1% level
	Std.dvn.	51.98	44.77		
	Number	66	14		
Teachers' Estimates					
English Estimate	Mean	103.50	96.00	1.12	N.S.
	Std.dvn.	22.40	24.32		
	Number	66	14		
Mathematics Estimate	Mean	98.63	76.92	1.74	N.S.
	Std.dvn.	43.51	22.28		
	Number	55	13		
Science Estimate	Mean	94.90	75.20	Difference not tested	
	Std.dvn.	41.54	15.81		
	Number	40	5		

TABLE 18. COMPARISON BETWEEN STUDENTS WHO PASS AND FAIL IN THE FACULTY OF ECONOMICS

MEANS AND STANDARD DEVIATIONS FOR T.E.E.P. PAPERS (STANDARD SCORES), HIGHER SCHOOL CERTIFICATE PERFORMANCE AND TEACHERS' ESTIMATES OF HIGHER SCHOOL CERTIFICATE PERFORMANCE

1969 UNIVERSITY ENTRANTS AUSTRALIAN NATIONAL UNIVERSITY

(Full-time students who sat for T.E.E.P. tests in 1968 as school leavers)

		Pass	Fail	t	Significance of difference between pass and fail
T.E.E.P. Tests					
T.E.E.P. Paper 1 (Quantitative)	Mean	57.17	58.10	-0.21	N.S.
	Std.dvn.	12.13	7.32		
	Number	12	10		
T.E.E.P. Paper 2 (Phys. & biol. sciences)	Mean	58.54	56.70	0.54	N.S.
	Std.dvn.	9.02	6.57		
	Number	13	10		
T.E.E.P. Paper 3 (Essays)	Mean	47.92	50.20	-0.44	N.S.
	Std.dvn.	15.39	6.63		
	Number	13	10		
T.E.E.P. Paper 4 (Social sciences)	Mean	53.15	51.27	0.41	N.S.
	Std.dvn.	13.53	7.16		
	Number	13	11		
T.E.E.P. Paper 5 (Art, literature, humanities)	Mean	51.08	47.18	1.01	N.S.
	Std.dvn.	7.82	11.10		
	Number	13	11		
T.E.E.P. Total (All five papers)	Mean	269.92	261.60	0.48	N.S.
	Std.dvn.	45.95	31.69		
	Number	12	10		
H.S.C. Subjects					
H.S.C. English	Mean	100.78	87.45	1.31	N.S.
	Std.dvn.	26.76	23.19		
	Number	14	11		
H.S.C. Mathematics	Mean	149.28	129.45	1.39	N.S.
	Std.dvn.	37.23	32.71		
	Number	14	11		
H.S.C. Science	Mean	151.41	137.50	1.00	N.S.
	Std.dvn.	30.05	35.17		
	Number	12	10		
Best five subjects	Mean	549.64	520.63	1.35	N.S.
	Std.dvn.	53.17	53.74		
	Number	14	11		
Teachers' Estimates					
English Estimate	Mean	91.50	85.63	0.78	N.S.
	Std.dvn.	17.96	19.51		
	Number	14	11		
Mathematics Estimate	Mean	120.21	95.18	2.21	5% level
	Std.dvn.	31.71	22.59		
	Number	14	11		
Science Estimate	Mean	107.66	114.60	-0.45	N.S.
	Std.dvn.	22.73	46.90		
	Number	12	10		

TABLE 19. COMPARISON BETWEEN STUDENTS WHO PASS AND FAIL IN THE FACULTY OF LAW (INCLUDING ARTS/LAW AND ECONOMICS/LAW) MEANS AND STANDARD DEVIATIONS FOR T.E.E.P. PAPERS (STANDARD SCORES), HIGHER SCHOOL CERTIFICATE PERFORMANCE AND TEACHERS' ESTIMATES OF HIGHER SCHOOL CERTIFICATE PERFORMANCE

1969 UNIVERSITY ENTRANTS AUSTRALIAN NATIONAL UNIVERSITY

(Full-time students who sat for T.E.E.P. tests in 1968 as school leavers)

		Pass	Fail	t	Significance of difference between pass and fail
T.E.E.P. Tests					
T.E.E.P. Paper 1 (Quantitative)	Mean	55.96	51.67		
	Std.dvn.	8.14	14.84		
	Number	23	3		
T.E.E.P. Paper 2 (Phys. & biol. sciences)	Mean	55.30	50.67		
	Std.dvn.	9.79	17.04		
	Number	23	3		
T.E.E.P. Paper 3 (Essays)	Mean	56.71	42.67		
	Std.dvn.	12.43	16.01		Differences not tested
	Number	21	3		
T.E.E.P. Paper 4 (Social Sciences)	Mean	59.13	52.67		because of small
	Std.dvn.	8.70	13.28		numbers in fail groups
	Number	23	3		
T.E.E.P. Paper 5 (Art, literature, humanities)	Mean	56.42	45.33		
	Std.dvn.	12.31	22.48		
	Number	24	3		
T.E.E.P. Total (All five papers)	Mean	285.86	243.00		
	Std.dvn.	33.29	63.00		
	Number	21	3		
H.S.C. Subjects					
H.S.C. English	Mean	112.96	63.67		
	Std.dvn.	18.86	16.86		
	Number	23	3		
H.S.C. Mathematics	Mean	136.05	78.00		
	Std.dvn.	56.69	22.63		
	Number	22	2		
H.S.C. Science	Mean	146.47	194.50		
	Std.dvn.	51.19	6.36		
	Number	17	2		
Best five subjects	Mean	553.04	471.00		
	Std.dvn.	79.53	42.93		
	Number	23	3		
Teachers' Estimates					
English Estimate	Mean	106.74	61.67		
	Std.dvn.	24.25	17.56		
	Number	23	3		
Mathematics Estimate	Mean	117.36	63.00		
	Std.dvn.	47.66	18.38		
	Number	22	2		
Science Estimate	Mean	125.47	110.00		
	Std.dvn.	55.50	35.36		
	Number	17	2		

TABLE 20. COMPARISON BETWEEN STUDENTS WHO PASS AND FAIL IN THE FACULTY OF ORIENTAL STUDIES

MEANS AND STANDARD DEVIATIONS FOR T.E.E.P. PAPERS (STANDARD SCORES), HIGHER SCHOOL CERTIFICATE PERFORMANCE AND TEACHERS' ESTIMATES OF HIGHER SCHOOL CERTIFICATE PERFORMANCE

1969 UNIVERSITY ENTRANTS AUSTRALIAN NATIONAL UNIVERSITY

(Full-time students who sat for T.E.E.P. tests in 1968 as school leavers)

		Pass	Fail	t	Significance of difference between pass and fail
T.E.E.P. Tests					
T.E.E.P. Paper 1 (Quantitative)	Mean	46.33	52.00		
	Std.dvn.	11.01	8.49		
	Number	9	2		
T.E.E.P. Paper 2 (Phys. & biol. sciences)	Mean	46.22	53.50		
	Std.dvn.	14.39	12.02		
	Number	9	2		
T.E.E.P. Paper 3 (Essays)	Mean	54.33	62.50		
	Std.dvn.	13.07	4.95		Differences not tested
	Number	9	2		
T.E.E.P. Paper 4 (Social sciences)	Mean	52.00	52.50		because of small
	Std.dvn.	9.49	0.71		numbers in fail groups
	Number	9	2		
T.E.E.P. Paper 5 (Art, literature, humanities)	Mean	58.22	53.00		
	Std.dvn.	13.69	11.31		
	Number	9	2		
T.E.E.P. Total (All five papers)	Mean	257.11	288.00		
	Std.dvn.	50.00			
	Number	9	1		
H.S.C. Subjects					
H.S.C. English	Mean	114.89	105.00		
	Std.dvn.	14.89	15.52		
	Number	9	3		
H.S.C. Mathematics	Mean	87.20	67.00		
	Std.dvn.	26.93			
	Number	5	1		
H.S.C. Science	Mean	95.00	70.50		
	Std.dvn.	51.50	14.85		
	Number	4	2		
Best five subjects	Mean	540.67	475.33		
	Std.dvn.	67.15	39.72		
	Number	9	3		
Teachers' Estimates					
English Estimate	Mean	114.22	95.00		
	Std.dvn.	29.79	13.00		
	Number	9	3		
Mathematics Estimate	Mean	91.00	45.00		
	Std.dvn.	19.76			
	Number	5	1		
Science Estimate	Mean	78.75	60.00		
	Std.dvn.	38.78	7.07		
	Number	4	2		

TABLE 21. COMPARISON BETWEEN STUDENTS WHO PASS AND FAIL IN THE FACULTY OF SCIENCE

MEANS AND STANDARD DEVIATIONS FOR T.E.E.P. PAPERS (STANDARD SCORES), HIGHER SCHOOL CERTIFICATE PERFORMANCE AND TEACHERS' ESTIMATES OF HIGHER SCHOOL CERTIFICATE PERFORMANCE

1969 UNIVERSITY ENTRANTS AUSTRALIAN NATIONAL UNIVERSITY

(Full-time students who sat for T.E.E.P. tests in 1968 as school leavers)

		Pass	Fail	t	Significance of difference between pass and fail
T.E.E.P. Tests					
T.E.E.P. Paper 1 (Quantitative)	Mean	62.43	63.15	-0.31	N.S.
	Std.dvn.	8.98	7.63		
	Number	44	20		
T.E.E.P. Paper 2 (Phys. & biol. sciences)	Mean	62.64	62.24	0.14	N.S.
	Std.dvn.	11.83	8.38		
	Number	44	21		
T.E.E.P. Paper 3 (Essays)	Mean	52.95	49.45	1.22	N.S.
	Std.dvn.	9.02	11.07		
	Number	44	20		
T.E.E.P. Paper 4 (Social sciences)	Mean	58.44	56.73	0.66	N.S.
	Std.dvn.	10.48	8.71		
	Number	43	22		
T.E.E.P. Paper 5 (Art, literature, humanities)	Mean	56.67	54.82	0.58	N.S.
	Std.dvn.	11.93	12.25		
	Number	42	22		
T.E.E.P. Total (All five papers)	Mean	292.50	284.89	0.81	N.S.
	Std.dvn.	38.82	29.14		
	Number	42	19		
H.S.C. Subjects					
H.S.C. English	Mean	96.09	85.92	2.02	5% level
	Std.dvn.	20.65	18.80		
	Number	43	25		
H.S.C. Mathematics	Mean	165.16	164.40	0.08	N.S.
	Std.dvn.	44.62	26.13		
	Number	43	25		
H.S.C. Science	Mean	177.00	169.04	0.86	N.S.
	Std.dvn.	42.51	23.34		
	Number	43	25		
Best five subjects	Mean	571.35	533.60	2.17	5% level
	Std.dvn.	77.06	52.59		
	Number	43	25		
Teachers' Estimates					
English Estimate	Mean	93.91	84.00	2.09	5% level
	Std.dvn.	20.57	15.33		
	Number	43	25		
Mathematics Estimate	Mean	134.93	131.36	0.33	N S.
	Std.dvn.	47.75	31.99		
	Number	43	25		
Science Estimate	Mean	150.31	139.28	0.94	N.S.
	Std.dvn.	54.15	30.36		
	Number	43	25		

TABLE 22. COMPARISON BETWEEN PART-TIME STUDENTS WHO PASS AND FAIL MEANS AND STANDARD DEVIATIONS FOR T.E.E.P. PAPERS (STANDARD SCORES), HIGHER SCHOOL CERTIFICATE PERFORMANCE AND TEACHERS' ESTIMATES OF HIGHER SCHOOL CERTIFICATE PERFORMANCE

1969 UNIVERSITY ENTRANTS AUSTRALIAN NATIONAL UNIVERSITY

(Part-time students who sat for T.E.E.P. tests in 1968 as school leavers)

		Pass	Fail	t	Significance of difference between pass and fail
T.E.E.P. Tests					
T.E.E.P. Paper 1 (Quantitative)	Mean	52.71	50.79	0.51	N.S.
	Std.dvn.	9.39	11.58		
	Number	17	14		
T.E.E.P. Paper 2 (Phys. & biol. sciences)	Mean	49.00	52.64	-0.88	N.S.
	Std.dvn.	12.74	9.56		
	Number	17	14		
T.E.E.P. Paper 3 (Essays)	Mean	54.71	48.64	1.65	N.S.
	Std.dvn.	10.95	9.22		
	Number	17	14		
T.E.E.P. Paper 4 (Social sciences)	Mean	48.88	49.46	-0.13	N.S.
	Std.dvn.	15.07	6.62		
	Number	17	13		
T.E.E.P. Paper 5 (Art, literature, humanities)	Mean	50.88	52.00	-0.26	N.S.
	Std.dvn.	13.32	9.23		
	Number	17	13		
T.E.E.P. Total (All five papers)	Mean	256.18	251.23	0.33	N.S.
	Std.dvn.	49.85	21.79		
	Number	17	13		
H.S.C. Subjects					
H.S.C. English	Mean	101.12	87.57	1.58	N.S.
	Std.dvn.	23.22	24.57		
	Number	17	14		
H.S.C. Mathematics	Mean	93.25	133.75	-2.32	5% level
	Std.dvn.	43.48	48.70		
	Number	16	12		
H.S.C. Science	Mean	85.25	127.75	-2.47	5% level
	Std.dvn.	30.33	51.17		
	Number	12	12		
Best five subjects	Mean	476.94	491.36	-0.59	N.S.
	Std.dvn.	83.37	40.84		
	Number	17	14		
Teachers' Estimates					
English Estimate	Mean	91.65	84.36	0.97	N.S.
	Std.dvn.	23.16	17.34		
	Number	17	14		
Mathematics Estimate	Mean	80.25	111.08	-1.88	N.S.
	Std.dvn.	31.39	54.97		
	Number	16	12		
Science Estimate	Mean	78.67	96.33	-1.65	N.S.
	Std.dvn.	20.79	30.77		
	Number	12	12		

TABLE 23. CORRELATIONS OF T.E.E.P. AND MATRICULATION TOTAL SCORES WITH FIRST YEAR PERFORMANCE IN THE FACULTIES OF DENTISTRY, MEDICINE AND SOCIAL WORK

1969 1ST YEAR STUDENTS UNIVERSITY OF QUEENSLAND

(Full-time students who sat for T.E.E.P. tests at the commencement of first year in 1969 and passed first year)

	FACULTY		
	Dentistry	Medicine	Social Work
T.E.E.P. total with University Performance	-0.03	0.27	0.30
Matric. total with University Performance	0.41	0.56	0.03
Number passed	23	162	49

TABLE 24. MEANS AND STANDARD DEVIATIONS (RAW SCORES) ON T.E.E.P. PAPERS FOR STUDENTS PASSING AND FAILING FIRST YEAR IN THE FACULTIES OF DENTISTRY, MEDICINE AND SOCIAL WORK

1969 1ST YEAR STUDENTS UNIVERSITY OF QUEENSLAND

(Full-time students who sat for T.E.E.P. tests at the commencement of 1st year in 1969)

	Successful Students (3 faculties combined)		Unsuccessful Students (3 faculties combined)		Significance of difference
	Mean	Std.dvn.	Mean	Std.dvn.	
T.E.E.P. Paper 1 (Quantitative)	22.17	7.18	19.48	6.69	N.S.
T.E.E.P. Paper 2 (Phys. & biol. sciences)	37.95	9.39	33.84	9.96	5% level
T.E.E.P. Paper 3 (Essays)	13.46	2.48	13.63	2.45	5% level
T.E.E.P. Paper 4 (Social sciences)	29.31	7.19	27.95	6.04	5% level
T.E.E.P. Paper 5 (Art, literature, humanities)	29.13	6.90	28.73	7.05	N.S.
T.E.E.P. Total	131.95	36.72	123.58	35.77	N.S.

Note : Although numbers have not been reported, significance levels based on the Kolmogorov-Smirnov 2-sample test have been provided by the University of Queensland.

TABLE 25. CORRELATIONS OF LEAVING SUBJECTS AND T.E.E.P. PAPERS WITH UNIVERSITY FIRST YEAR ARTS AND SOCIAL SCIENCE SUBJECTS

1969 UNIVERSITY ENTRANTS UNIVERSITY OF WESTERN AUSTRALIA

(see footnote next page)

UNIVERSITY SUBJECTS	LEAVING SUBJECTS												T.E.E.P. PAPERS				
	English	French	German	History	Geography	Economics	Maths A	Maths B	Gen.Maths	Physics	Chemistry (Old)	Biology	Quantitative	Science	Essays	Social Sciences	Humanities
English	0.42**	0.41**	0.31*	0.34**				0.24*		0.26*					0.27**	0.26**	0.24**
French	0.37**	0.62**	0.58**	0.27*						0.54**						0.26*	0.25*
French	0.64*																
Geography	0.43**			0.41**		0.31*										0.24*	
German		0.51**	0.71**													0.33*	0.34*
German		0.70*															0.70*
History															0.42*		
History																0.66*	
History	0.37**			0.43**	0.29*	0.33*					0.36*						
Politics	0.44**	0.73**		0.63**		0.46*		0.43*		0.48**		0.61*			0.42*	0.34*	
Philosophy	0.30**				0.57**		0.38**	0.31*		0.42**	0.58**		0.35**	0.47**		0.37**	
Psychology	0.25**	0.32**		0.34**	0.24*	0.48**	0.23*	0.36**	0.31*	0.36**	0.53**	0.49**	0.24*	0.37*		0.36**	0.30**
Anthropology	0.27**	0.38*				0.38**				0.47**		0.26*		0.30**	0.35**	0.38**	0.27*
Constitutional Law	0.38**				0.63**				0.80**		0.39*					0.49**	
Contracts				0.44**	0.73**	0.50**			0.77**	0.39*		0.52*	0.29*				
Physical Education												0.66**					
Economics		0.48**		0.23*		0.26**	0.25*	0.29**	0.30*	0.40**	0.50**	0.29**					
Economic History		0.62*		0.42**						0.53**							
Accounting and Finance						0.38**	0.40**	0.44**				0.53**	0.27*				
Legal Framework of Business												0.49*					

TABLE 26. CORRELATIONS OF LEAVING SUBJECTS AND T.E.E.P. PAPERS WITH UNIVERSITY FIRST YEAR SCIENCE SUBJECTS

1969 UNIVERSITY ENTRANTS UNIVERSITY OF WESTERN AUSTRALIA

UNIVERSITY SUBJECTS	LEAVING SUBJECTS														T.E.E.P. PAPERS				
	English	Latin	French	German	History	Geography	Economics	Maths A	Maths B	Gen.Maths	Physics	Chemistry (Old)	Biology	Chemistry (New)	Quantitative	Science	Essays	Social Sciences	Humanities
Biology	0.25**				0.50**	0.44**	0.45**	0.33**	0.41**		0.45**	0.55**	0.57**		0.33**	0.21*	0.30**	0.28**	
Biology	0.39*											0.59**							
Chemistry	0.30**	0.53*	0.32*	0.65*		0.24**	0.37**	0.37**	0.53**		0.52**	0.65**		0.68**	0.33**	0.36**	0.18*	0.32**	0.20**
Chemistry	0.36**					0.31*		0.45**	0.45**		0.50**	0.55**		0.57*	0.31**	0.40**	0.23*	0.25*	0.29**
Chemistry								0.36**	0.49**		0.49**	0.41**							
Geology						0.35*		0.29*	0.42**		0.37*	0.51**							
Mathematics								0.31*	0.42**			0.55**							
Mathematics	0.24**	0.63**			0.36**	0.30**	0.27**	0.52**	0.57**	0.64**	0.60**	0.58**	0.39**	0.78**	0.37**	0.36**		0.18*	0.18*
Mathematics						0.26**	0.23*	0.32**	0.46**		0.43**	0.34**		0.61**	0.18*	0.25**		0.18**	
Applied Maths	0.31**		0.36*					0.30**	0.47**		0.54**	0.62**			0.30**	0.43**		0.31**	0.27**
Physics	0.36**		0.67*					0.57**	0.59**		0.66**	0.61**			0.61**	0.61**	0.25	0.46**	0.42**
Physics						0.39*		0.33**	0.44**		0.39**	0.45**			0.25**	0.40**			
Physics	0.23*		0.51*			0.31*	0.45*	0.30**	0.29*		0.50**	0.52**			0.40**			0.38**	
Biology	0.30**							0.25*	0.26*		0.51**	0.41**	0.39**			0.37**		0.42**	0.35**
English	0.33**		0.71*				0.32*	0.45**	0.48**		0.58**	0.51**			0.44**	0.48**		0.40**	0.35**
Materials Science	0.53*																		

* significant at the 5% level ** significant at the 1% level

Note : Only significant correlations where the number of cases exceeded ten have been reported from Western Australia.

APPENDIX 1

ANALYSIS OF VARIANCE TABLES FOR DIFFERENCES BETWEEN FACULTIES AT THE AUSTRALIAN NATIONAL UNIVERSITY

	Source of variation	Sum of squares	Degrees of freedom	Mean square	F
T.E.E.P. Paper 1 :					
	Between faculties	7049.88	4	1762.47	18.99***
	Within faculties (error)	18281.07	197	92.80	
	Total	25330.95	201		
T.E.E.P. Paper 2 :					
	Between faculties	5490.19	4	1372.55	12.90***
	Within faculties (error)	21175.94	199	106.41	
	Total	26666.13	203		
T.E.E.P. Paper 3 :					
	Between faculties	2139.06	4	534.77	4.68**
	Within faculties (error)	22295.72	195	114.34	
	Total	24434.78	199		
T.E.E.P. Paper 4 :					
	Between faculties	1016.47	4	254.12	2.86*
	Within faculties (error)	17502.41	197	88.84	
	Total	18518.88	201		
T.E.E.P. Paper 5 :					
	Between faculties	957.91	4	239.48	1.89
	Within faculties (error)	24522.17	194	126.40	
	Total	25480.08	198		

* significant at the 5% level
** significant at the 1% level
*** significant at the 0:1% level

APPENDIX 2

ANALYSIS OF VARIANCE TABLES FOR DIFFERENCES BETWEEN FACULTIES AT THE UNIVERSITY OF QUEENSLAND

	Source of variation	Sum of squares	Degrees of freedom	Mean square	F
T.E.E.P. Paper 1 :					
	Between faculties	4802.32	2	2402.16	75.11***
	Within faculties (error)	8921.4	279	31.98	
	Total	13725.72	281		
T.E.E.P. Paper 2 :					
	Between faculties	6193.84	2	3096.92	51.02***
	Within faculties (error)	16935.97	279	60.70	
	Total	23129.81	281		
T.E.E.P. Paper 4 :					
	Between faculties	433.32	2	216.66	5.00**
	Within faculties (error)	12096.29	279	43.36	
	Total	12529.61	281		
T.E.E.P. Paper 5 :					
	Between faculties	980.76	2	490.38	12.13***
	Within faculties (error)	11279.25	279	40.43	
	Total	12260.01	281		

** significant at the 1% level

*** significant at the 0.1% level

APPENDIX 3

ANALYSIS OF VARIANCE TABLES FOR DIFFERENCES BETWEEN SCHOOL LEAVERS THROUGHOUT AUSTRALIA

	Source of variation	Sum of squares	Degrees of freedom	Mean square	F
T.E.E.P. Paper 1 :					
	Between States	1405.63	2	702.82	19.63***
	Within States (error)	165486.07	4622	35.80	
	Total	166891.70	4624		
T.E.E.P. Paper 2 :					
	Between States	2227.10	2	1113.55	16.04***
	Within States (error)	320563.06	4618	69.42	
	Total	322790.16	4620		
T.E.E.P. Paper 4 :					
	Between States	5699.46	2	2849.73	57.92***
	Within States (error)	226224.85	4598	49.2	
	Total	231924.31	4600		
T.E.E.P. Paper 5 :					
	Between States	2729.74	2	1364.87	36.43***
	Within States (error)	171736.68	4583	37.47	
	Total	174466.42	4585		

*** significant at the 0.1% level

APPENDIX 4

STATISTICAL FORMULAE USED IN TESTS OF SIGNIFICANCE

Given that $(\bar{x}_1, s_1, n_1)$ and $(\bar{x}_2, s_2, n_2)$ represent the mean, standard deviation and number of cases respectively for two samples, then

$$z = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}} \qquad \text{(for normal distribution)}$$

and

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\left[\frac{(n_1 - 1)s_1^2 + (n_2 - 1)s_2^2}{n_1 + n_2 - 2}\right]\left[\frac{n_1 + n_2}{n_1 n_2}\right]}}$$

with $n_1 + n_2 - 2$ degrees of freedom (for "Student's t" distribution)

APPENDIX 5.

Extract from report from the University of Western Australia on the relationship between T.E.E.P. Series B, Matriculation and University performance.

CORRELATIONS (TETRACHORIC ESTIMATES)

First Year Performance with Leaving, Matriculation and TEEP Aggregates (Series B)

	SAMPLE SIZES		CORRELATIONS WITH PERFORMANCE		
	Leaving & Matric.	TEEP	Leaving	Matric.	TEEP
Arts	341	293	0.670*	0.600*	0.320*
Law	71	55	0.710*	0.580*	0.570*
Architecture	16	15	0.320	0.550	0.500
Education	35	31	0.620*	0.600*	0.000
Economics	38	32	0.400	0.520	0.040
Commerce	80	56	0.600*	0.410	0.430
Humanities and Social Sciences	529	436	0.670*	0.510*	0.320*
Science	261	233	0.700*	0.610*	0.620*
Engineering	172	129	0.680*	0.740*	0.640*
Agriculture	26	23	0.830*	0.670*	0.480
Dental Science	16	13	0.330	0.550	0.500
Medicine	103	91	0.720*	0.690*	0.340
All Sciences	587	497	0.705*	0.650*	0.465*

* significant at the 1% level (based on value for "r" with $\frac{1}{2}N$ for r_t)

"Humanities and Social Sciences" does not include Education or Architecture.

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